Public Input No. 2422-NFPA 70-2023 [Global Input]

See Attached File - Which Includes multiple related changes, all under the purview of CMP 1.

Additional Proposed Changes

File Name	Description	Approved
PI_For_CMP_1_Voltage_Demarcation_.docx	Global PI for CMP 1 (Consistent Voltage Demarcation)	

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of a Correlating Committee Task Group consisting of Robert Osborne (Chair), Paul Barnhart, Lou Grahor, Donny Cook, Scott Higgins, Mike Querry, Roger McDaniel, Dave Burns, Rod Belisle, Kevin Rogers, Tony Ricciuti, Paul Knapp, Paul Sullivan, George Smith, Eric Simmon, Kevin Arnold, Larry Wildermuth, and Kyle Krueger.

Changes related to the voltage demarcation have been grouped to assist the CMP with review and resolution, with each change, and it's corresponding substantiation, noted in the table below: (table provided in attachment)

Submitter Information Verification

Submitter Full Name: Robert Osborne
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 09:26:37 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9213-NFPA 70-2024
Statement: Sections of Article 110 have been revised to clarify the voltage rating of "not over 1000 volts ac, 1500 volts dc, nominal" where a voltage range is indicated. Voltage range was deleted in the body of the text where not necessary due to the title of the Part of the Article.

This Public Input is submitted on behalf of a Correlating Committee Task Group consisting of Robert Osborne (Chair), Paul Barnhart, Lou Grahor, Donny Cook, Scott Higgins, Mike Querry, Roger McDaniel, Dave Burns, Rod Belisle, Kevin Rogers, Tony Ricciuti, Paul Knapp, Paul Sullivan, George Smith, Eric Simmon, Kevin Arnold, Larry Wildermuth, and Kyle Krueger.

Changes related to the voltage demarcation have been grouped to assist the CMP with review and resolution, with each change, and it's corresponding substantiation, noted in the table below:

Reference	Suggested Revision	Substantiation
Article 110, Part II	**Part II. Not Over 1000 Volts ac, 1500 Volts dc, Nominal~~, or Less~~**	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.26(A)	**Working Space.** Working space for equipment ~~operating at 1000 volts, nominal, or less to ground and~~ likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the…	With the identification in the title of Part II. that the requirements apply to certain voltage ranges, the inclusion of this detail in this section is unnecessary.
110.26(A)(4)	**Limited Access.** Where equipment ~~operating at 1000 volts, nominal, or less to ground and~~ likely to require …	With the identification in the title of Part II. that the requirements apply to certain voltage ranges, the inclusion of this detail in this section is unnecessary.
110.26(A)(5)	**Separation from High-Voltage Equipment.** Where switches, cutouts, or other equipment operating at not over 1000 volts ac, 1500 volts dc, nominal, ~~or less~~ are installed in a vault, room, or enclosure where there are exposed live parts or exposed wiring operating over 1000 volts ac, 1500 volts dc, nominal, the high-voltage equipment …	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.27(A)	**Live Parts Guarded Against Accidental Contact.** … of electrical equipment operating at 50 volts ac/dc to 1000 volts ac, 1500 volts dc, nominal shall be guarded against …	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.28	**Enclosure Types.** … transformers, fire pump controllers, fire pump motors, and motor controllers, ~~rated not over 1000 volts nominal~~ and…	With the identification in the title of Part II. that the requirements apply to certain voltage ranges, the inclusion of this detail in this section is unnecessary.
Article 110, Part III	**Part III. Over 1000 Volts ac, 1500 Volts dc, Nominal**	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.30	**General.** Conductors and equipment used on circuits over	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is

Reference	Suggested Revision	Substantiation
	1000 volts ac, 1500 volts dc, nominal, shall comply with Part I of this article and with **110.30** through **110.41**, which supplement or modify Part I. In no case shall this part apply to equipment on the supply side of the service point.	1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.33(A)(2)	**Guarding.** Where bare energized parts at any voltage or insulated energized parts ~~above 1000 volts, nominal,~~ are located adjacent to such entrance, they shall be suitably guarded.	With the identification in the title of Part II. that the requirements apply to certain voltage ranges, the inclusion of this detail in this section is unnecessary.
110.34(B)	**Separation from Low-Voltage Equipment.** …Where switches, cutouts, or other equipment operating at not over 1000 volts ac, 1500 volts dc, nominal, ~~or less~~ installed in a vault, room,…	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.34(C)	**Locked Rooms or Enclosures.** … exposed conductors ~~operating at over 1000 volts, nominal,~~ shall be kept locked unless such …	With the identification in the title of Part II. that the requirements apply to certain voltage ranges, the inclusion of this detail in this section is unnecessary.
Article 110, Part IV	**Part IV. Tunnel Installations Over 1000 Volts ac, 1500 Volts dc, Nominal**	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.73	**Equipment Work Space.** Where electrical equipment with live parts that is likely to require examination, adjustment, servicing, or maintenance while energized is installed in a manhole, vault, or other enclosure designed for personnel access, the work space and associated requirements in **110.26** shall be met for installations operating at not over 1000 volts ac, 1500 volts dc, nominal ~~or less~~. Where the installation is over 1000 volts ac, 1500 volts dc, nominal, the work space…	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.74(A)	Not Over 1000 Volts ac, 1500 Volts dc, Nominal~~, or Less~~. Wire bending space for conductors operating not over ~~at~~ 1000 volts ~~or less~~ ac, 1500 volts dc, nominal, shall be provided in accordance with 314.28.	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a limit for accepted overvoltages.
110.74(B)	Over 1000 Volts ac, 1500 Volts dc, Nominal. Conductors operating at over 1000 volts ac, 1500 volts dc, nominal, shall be provided with bending space in accordance with 314.71(A) and (B), as applicable.	The voltage limitation for work spaces should be based on the peak voltage of the system. Peak voltage of a 1000 vac (rms) circuit is 1414 volts. If the overvoltage permitted by electric utilities is taken into consideration, the voltage for a 1000 vac system would be 1,060 volts ac. The corresponding dc voltage is 1,499 volts. It is recognized that a nominal range with DC may result in higher values; however, the requirement indicates "nominal", and is not a

Reference	Suggested Revision	Substantiation
		limit for accepted overvoltages.

Public Input No. 3085-NFPA 70-2023 [Global Input]

This Global Public Input is for all Technical Committees and review their informational notes and the requirements in the NEC Style Manual Section 2.1.10 for informational notes.

Statement of Problem and Substantiation for Public Input

This Global Public Input is for all Technical Committees and review their informational notes and the requirements in the NEC Style Manual Section 2.1.10 for informational notes.
2.1.10.3 Format. Informational notes shall be structured as shown in the example, using the word “See” followed by the reference standard, the title of the standard and section if used, and an explanation for the reference.
Example:
"See" "Referenced Standard", "Standard Title", "Section Number", "Explanation of the reference"
Informational Note: See NFPA 101, Life Safety Code, 7.8, for illumination of means of egress.
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: Tue Aug 29 11:15:17 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8925-NFPA 70-2024
Statement: The Panel reviewed the informational notes within their purview to comply with the NEC Style Manual Section 2.1.10. and made the following revisions.

The Panel reviewed and revised the informational notes within their purview to comply with the NEC Style Manual Section 2.1.10 and updated the edition years and titles of the referenced standards in their first revisions throughout the Code.

CMP-2 reviewed Articles 210 and 220. The Informational Note in 210.12(A) is included to differentiate between different methods of AFCI protection. The Informational note is not in conflict with the NEC Style Manual. All Informational Notes in Article 220 appear to be in compliance with the NEC Style Manual.

Public Input No. 4075-NFPA 70-2023 [Global Input]

Anywhere that 2019 NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance* is referenced in the NEC as an informational note, that it be changed to: NFPA 70B, *Standard for Electrical Equipment Maintenance.*

Statement of Problem and Substantiation for Public Input

There are two problems this will correct:
1. NFPA 70B was elevated to a standard during the last revision cycle, unfortunately it was not completed prior to the Public Input deadline for the 2023 NEC so many of the references are outdated.
2. By removiong the date in the informational note reference, there will be built in shelf life as this will now imply the most recent edition of 70B is being referenced.

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: National Electrical Contractor Association
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 15:44:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8925-NFPA 70-2024
Statement: The Panel reviewed the informational notes within their purview to comply with the NEC Style Manual Section 2.1.10. and made the following revisions.

The Panel reviewed and revised the informational notes within their purview to comply with the NEC Style Manual Section 2.1.10 and updated the edition years and titles of the referenced standards in their first revisions throughout the Code.

CMP-2 reviewed Articles 210 and 220. The Informational Note in 210.12(A) is included to differentiate between different methods of AFCI protection. The Informational note is not in conflict with the NEC Style Manual. All Informational Notes in Article 220 appear to be in compliance with the NEC Style Manual.

Public Input No. 4085-NFPA 70-2023 [Global Input]

Change the word "shall" to the word "must" based on ruling by the Supreme Court of the United States that the word "shall" is not necessarily mandatory. The word "must" is to be used to refer to mandatory provisions.

Thank you for considering
Gaye Chapman
Senior Electrcial Inspector, City of Los Angeles

Statement of Problem and Substantiation for Public Input

The problem that would be resolved is the minimization of litigation propagating from the use of the word "shall" in mandatory Code provisions.

Submitter Information Verification

Submitter Full Name: Gaye Chapman
Organization: IAEI
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 16:14:19 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Replacing shall with must is a violation of 3.1.1 of The NEC Style Manual

Public Input No. 4287-NFPA 70-2023 [Global Input]

Clearly identify any requirements which are not applicable to DC circuits by incorporating the recommended terminology as applicable:

“Applicable to…[ac][single-phase][three-phase][wye][delta] circuits only”.

“Not applicable to dc circuits”

“[Volts] ac only”

Other terminology that clearly applies to a specific ac (or dc) application, such as through a defined term or unique equipment.

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of a Correlating Committee DC Task Group consisting of Danish Zia, Jason Fisher, Randy Dollar, Larry Wildermuth, Scott Higgins, Scott Harding, Mark Earley, Jason Hopkins, Christopher Vance, Chad Kennedy and Derrick Atkins. This Public Input, along with other Public Inputs, was developed with the goal of improving usability and accuracy on requirements associated with DC circuits.

DC residential and commercial installations are emerging in the electrical infrastructure and are expected to be a growing alternative to the traditional AC utility fed building. Examples include the US DOE Grid-interactive Efficient Buildings project (Note 1), the Purdue University RENEWW house (Note 2), and a DC Microgrid community in Vermont (Note 3). These installations may involve buildings that are distributed entirely with DC, or with an AC/DC hybrid distribution.

Although DC electrical distribution topics are covered by the NEC, the focus of most residential and commercial installations and the Code has historically been AC power. Many requirements are written using AC terminology or referencing only AC technology, but without distinction as to whether the requirement is also applicable to DC circuits or installations. Usage of terms such as “2-wire” and “3-wire”, or listing AC only voltages as informative references without appropriate mandatory language or further clarification may not provide sufficient clarity as to whether a requirement applies to DC circuits. This may leave the AHJ and other users of the Code confused. This public input recommends that such requirements be reviewed and clarified using the recommended terminology proposed.

Note 1 - https://www.energy.gov/sites/default/files/2020/09/f79/bto-geb-project-summary-093020.pdf
Note 2 - https://engineering.purdue.edu/ME/News/2022/purdue-house-runs-entirely-on-dc-power
Note 3 - https://www.efficiencyvermont.com/Media/Default/docs/white-papers/Energy_Resilience.pdf

Submitter Information Verification

Submitter Full Name: Danish Zia
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 09:28:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed language would lead to inconsistent use of ac and dc applicability across the Code. CMP-2 addressed applicability to dc circuits in Article 220 with FR-7991 [new 220.5(D)]. No further action was necessary.

Public Input No. 543-NFPA 70-2023 [Section No. 90.1]

90.1 Scope.

This article covers use and application, arrangement, and enforcement of this ~~Code~~ standard . It also covers the expression of mandatory, permissive, and nonmandatory text, provides guidance on the examination of equipment and on wiring planning, and specifies the use and expression of measurements.

Statement of Problem and Substantiation for Public Input

Change the term “Code” to “standard.” Section 1.1, Scope of Regulations, in the "Regulations Governing the Development of NFPA Standards" state that "[t]hese regulations cover the process of developing and revising NFPA Standards and the role of the Board of Directors, Standards Council, correlating committees, and technical committees in this process." Per the definition of “standard” (NFPA Standard) from 1.4, Defined Terms, in the "Regulations Governing the Development of NFPA Standards," a standard (NFPA Standard or Standard) is “[a]ny NFPA Standard processed through these regulations. There are four types of NFPA Standards: codes, standards, recommended practices, and guides (see Section 3.3.6.1). The term NFPA Standard includes, as the context requires, proposed NFPA Standards that are in the process of development or revision.” One reason for this change is that the NFPA 79 Technical Committee saw the need to create a Second Revision to extract material since the definition of "Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular code or standard requirement. [70, 2023]" in "3.3.60* refers to "Code" and that committee did not recognize the NEC as a standard as it is defined in the "Regulations Governing the Development of NFPA Standards" (See SR-4, Section No. 3.3.60)." Note that, per the title of "Regulations Governing the Development of NFPA Standards," these regulations govern "standards" and thereby consider the NEC a standard subject to the regulations in the "Regulations Governing the Development of NFPA Standards." This revision is requested and is to be considered a global change. It is being submitted here as it is the first instance of the use of "Code" rather than "NEC" or "National Electrical Code (NEC)" or NFPA 70. It is the intent of this recommendation that this change be made throughout the NEC everywhere appropriate and that the NEC Correlating Committee correlate this change throughout the NEC as a correlation, rather than technical, action.

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 07 17:37:35 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The NEC is a voluntary code that will be adopted by an AHJ. On the NFPA web site of list of codes and standards, the NFPA 70 is listed as “National Electrical Code”. From the NFPA website the explanation given is that · A code is a model, a set of rules that knowledgeable people recommend for others to follow. It is not a law, but can be adopted into law. · A standard tends be a more detailed elaboration, the nuts and bolts of meeting a code. Given 90.2A states that the NEC is not an instruction manual (i.e., a more nuts and bolts elaboration), it seems appropriate to keep the current description as the Code. Furthermore, the statement that a code can be adopted as a law better fits the current and intended use of the NEC.

Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)]

(A) Practical Safeguarding.

~~The purpose of this~~ ~~*Code*~~ ~~is the~~ This *Code* is for 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. Qualified persons shall be trained in the arrangement and application of this *Code* as provided in Section 90.3.

Informational Note No.1: See definition of qualified person in Article 100.

Informational Note No. 2: Evidence of minimum qualifications, training and experience is often demonstrated through credentials such as licensing, certification, and completion of recognized apprenticeship and training programs.

Statement of Problem and Substantiation for Public Input

Qualified persons must not only meet the specific criteria spelled out in the definition of the term, but they should also be specifically trained in the proper use and application of the NEC® and how it applies generally and to specific installations and systems. A qualified person can be totally trained in the construction and operation of equipment and had received safety training on the hazards, but the same person often has little or no training in use of the NEC®, which is a gap that often results in misapplication of NEC® rules or ignorance of the rules all together. The NEC® must be applied to installations and systems by many more beyond the authority having jurisdiction. The proposed revision in no way intends to include text related to who performs the work covered by the Code, but only draws needed emphasis on the fact that the NEC® must be an integral part of the experience and training needed by persons using it. Proposed Informational Note No. 2 is intended to provide examples of how minimum qualifications are handled in many jurisdictions that exercise legal adoption of the NEC®.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1708-NFPA 70-2023 [New Section after 800.3]	
Public Input No. 1706-NFPA 70-2023 [New Section after 770.3]	
Public Input No. 1701-NFPA 70-2023 [New Section after 760.3]	
Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]	
Public Input No. 1695-NFPA 70-2023 [New Section after 725.3]	
Public Input No. 1694-NFPA 70-2023 [New Section after 724.3]	
Public Input No. 1690-NFPA 70-2023 [New Section after 722.3]	
Public Input No. 1686-NFPA 70-2023 [New Section after 708.8]	
Public Input No. 1684-NFPA 70-2023 [New Section after 701.7]	
Public Input No. 1672-NFPA 70-2023 [New Section after 700.8]	
Public Input No. 4394-NFPA 70-2023 [New Section after 625.6]	
Public Input No. 1629-NFPA 70-2023 [New Section after 393.6]	
Public Input No. 1629-NFPA 70-2023 [New Section after 393.6]	
Public Input No. 1672-NFPA 70-2023 [New Section after 700.8]	
Public Input No. 1684-NFPA 70-2023 [New Section after 701.7]	
Public Input No. 1686-NFPA 70-2023 [New Section after 708.8]	
Public Input No. 1690-NFPA 70-2023 [New Section after 722.3]	
Public Input No. 1694-NFPA 70-2023 [New Section after 724.3]	
Public Input No. 1695-NFPA 70-2023 [New Section after 725.3]	
Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]	
Public Input No. 1701-NFPA 70-2023 [New Section after 760.3]	
Public Input No. 1706-NFPA 70-2023 [New Section after 770.3]	
Public Input No. 1708-NFPA 70-2023 [New Section after 800.3]	
Public Input No. 4394-NFPA 70-2023 [New Section after 625.6]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: National Electrical Contractor Association (NECA)
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 14:17:48 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The definition for qualified persons does not address training requirements specific to the proper use and application of the Code.

Public Input No. 2261-NFPA 70-2023 [Section No. 90.2(A)]

(A) Practical Safeguarding.

The purpose of this *Code* is the practical safeguarding of persons and property from hazards arising from the use of electricity as a source of electric shock and as a potential source of fires and explosions due to electrical installations . This *Code* is not intended as a design specification or an instruction manual for untrained persons.

Statement of Problem and Substantiation for Public Input

Added text from the “Committee Scope”. This language is more explanatory on why we have a Code and what are we practically safeguarding against.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 15 14:13:48 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The Public Input does not meet 4.3.4.1(d) of the Regulations Governing the Development of NFPA Standards which requires the submitter to provide a statement of the problem and substantiation for Public Input. Stating “this language is more explanatory” has not been substantiated.

Public Input No. 3538-NFPA 70-2023 [Section No. 90.2(A)]

(A) Practical Safeguarding.

The purpose of this *Code* is to establish the minimum requirements for 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.

Statement of Problem and Substantiation for Public Input

By adding this language, it will make it explicitly clear that the NEC is a minimum standard. It has always been implied that it is a minimum standard, however I do not believe the current text states that the NEC is in fact a minimum standard. This language would also bring the purpose of the NEC to closely resemble the purpose or intent of other model codes.

Submitter Information Verification

Submitter Full Name: Richard Hollander
Organization: Shums Coda Associates
Street Address:
City:
State:
Zip:
Submittal Date: Mon Sep 04 18:01:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The Code contains provisions that are considered necessary for safe electrical installations. Compliance will result in an installation essentially free from hazard. The code does not establish the minimum requirements – the AHJ or applicable regulatory body does that when it adopts the complete NEC or with optional exemptions or specific additions appropriate for the local environment and circumstances.

Public Input No. 4-NFPA 70-2023 [Section No. 90.2(A)]

(A) Practical Safeguarding.

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, or a medium voltage inspection guide for untrained inspectors .

Statement of Problem and Substantiation for Public Input

In recent years we have had people with inadequate qualifications adding medium voltage related rules to the NEC, largely because the inspection community complains of not knowing how to inspect medium voltage. Such is not the purpose of the NEC, and such a motivation would work against the stated purpose of the NEC.

Submitter Information Verification

Submitter Full Name: John Doe
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 03 20:05:16 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The substantiation does not meet 4.3.4.1(d) of the Regulations Governing the Development of NFPA Standards. The statements that “people with inadequate qualifications are adding medium voltage rules” and “inspectors don’t know how to inspect medium voltage” have not been substantiated.

Public Input No. 5-NFPA 70-2023 [Section No. 90.2(A)]

(A) Practical Safeguarding.

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 code may not be suitable for minors due to its regulation of drug activity.

Statement of Problem and Substantiation for Public Input

With the addition of article 512 the NEC now regulates illegal and immoral drug activity, and conceivably could cover anything else. Viewer discretion is advised and we should include such a warning as this.

Submitter Information Verification

Submitter Full Name: John Doe
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 03 20:11:19 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Article 512 Cannabis Oil Equipment and Cannabis Oil Systems Using Flammable Materials was added in the Code to provide installation requirements in commercial and industrial facilities. The statement that “the NEC now regulates illegal and immoral drug activity” has not been substantiated.

Public Input No. 714-NFPA 70-2023 [Section No. 90.2(A)]

(A) Practical Safeguarding.

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 is a model code and has no legal effect until adopted by the authority having jurisdiction. The authority having jurisdiction may implement this *Code* in full or in part, and may make any modifications to this *Code* (even if explicitly prohibited by some sections of this *Code*) before implementing it. Not complying with this *Code* does not necessarily mean an installation is improper or illegal. An installation is perfectly up to legal compliance when the installation meets the regulations imposed by all levels of government but does not meet certain provisions of this *Code* . Similarly, meeting the entirety of this *Code* but not meeting certain modifications by any level of government would mean the installation is unlawful.

Statement of Problem and Substantiation for Public Input

It makes it totally clear and unambiguous what is lawful and what is not.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 25 22:43:27 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The substantiation does not meet 4.3.4.1(d) of the Regulations Governing the Development of NFPA Standards which requires the submitter to provide a statement of the problem and substantiation for Public Input. The Panel concludes that “what is lawful and what is not” has not been substantiated.

Public Input No. 3-NFPA 70-2023 [Section No. 90.2(B)]

(B) Adequacy.

This *Code* contains provisions that are considered necessary for safety. Compliance therewith and proper maintenance result in an installation that is essentially free from hazard but not necessarily legal, efficient, convenient, or adequate for good service or future expansion of electrical use.

Informational Note: Hazards often occur because of overloading of wiring systems by methods or usage not in conformity with this *Code*. This occurs because initial wiring did not provide for increases in the use of electricity. An initial adequate installation and reasonable provisions for system changes provide for future increases in the use of electricity.

Statement of Problem and Substantiation for Public Input

With the creation of article 512, the NFPA has indicated its interest in regulating illegal activity. Therefore, it is necessary to state that a code compliant installation may still be an illegal one.

Submitter Information Verification

Submitter Full Name: John Doe
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 03 20:01:29 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Article 512 Cannabis Oil Equipment and Cannabis Oil Systems Using Flammable Materials was added in the Code to provide installation requirements in commercial and industrial facilities. The statement that “NFPA has indicated its interest in regulating illegal activity” has not been substantiated.

Public Input No. 3539-NFPA 70-2023 [Section No. 90.2(B)]

(B) Adequacy.

This *Code* contains provisions that are ~~considered necessary for~~ considered the necessary minimum for safety. Compliance therewith and proper maintenance result in an installation that is essentially free from hazard but not necessarily efficient, convenient, or adequate for good service or future expansion of electrical use.

Informational Note: Hazards often occur because of overloading of wiring systems by methods or usage not in conformity with this *Code*. This occurs because initial wiring did not provide for increases in the use of electricity. An initial adequate installation and reasonable provisions for system changes provide for future increases in the use of electricity.

Statement of Problem and Substantiation for Public Input

By adding this language, it will make it explicitly clear that the NEC is a minimum standard. It has always been implied that it is a minimum standard, however I do not believe the current text states that the NEC is in fact a minimum standard. This language would also bring the purpose of the NEC to closely resemble the purpose or intent of other model codes.

Submitter Information Verification

Submitter Full Name: Richard Hollander
Organization: Shums Coda Associates
Street Address:
City:
State:
Zip:
Submittal Date: Mon Sep 04 18:04:52 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The Code contains provisions that are considered necessary for safe electrical installations. Compliance will result in an installation essentially free from hazard. The code does not establish the minimum requirements – the AHJ or applicable regulatory body does that when it adopts the complete NEC or with optional exemptions or specific additions appropriate for the local environment and circumstances.

Public Input No. 3779-NFPA 70-2023 [Section No. 90.2(C)]

(C) Installations Covered.

This *Code* covers the installation and removal of electrical conductors, equipment including utilization equipment , and raceways; signaling and communications conductors, equipment, and raceways; and optical fiber cables for the following:

(1) Public and private premises, including buildings, structures, mobile homes, recreational vehicles, and floating buildings

(2) Yards, lots, parking lots, carnivals, and industrial substations

(3) Installations of conductors and equipment that connect to the supply of electricity

(4) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center

(5) Installations supplying shore power to ships and watercraft in marinas and boatyards, including monitoring of leakage current

(6) Installations used to export electric power from vehicles to premises wiring or for bidirectional current flow

Statement of Problem and Substantiation for Public Input

the 'equipment' reference in this section along with other language, such as in the definition of premise wiring stating "Such wiring does not include wiring internal to appliances, luminaires, motors, controllers, motor control centers, and similar equipment" are construed as to NOT include utilization equipment within the scope of the NEC.

I have also see the following in quotations below to make the conclusion utilization equipment not with in the NEC "NEC Section 90.2, Scope, does not clearly define "electrical equipment". The word "outlet" as defined in Premise Wiring is more than a receptacle (wall plug). The following definition from NEC Article 100, Definitions, includes "electrical equipment" and Utilization Equipment."

The NEC needs to clarify at the scope level that utilization equipment is within the NEC and adding the text 'Including utilization equipment' will make it clear it is included.

OSHA makes it clear in the provisions of 29 CFR §§ 1910.302 through 1910.308 (Covered) cover electrical installations and utilization equipment installed or
used within or on buildings, structures, and other premises, including: ~

Submitter Information Verification

Submitter Full Name: Alfio Torrisi
Organization: Triad National Security, LLC.
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 16:01:25 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Equipment is defined as a general term and can include utilization equipment. The added text does not provide clarity.

Public Input No. 4181-NFPA 70-2023 [Section No. 90.2(C)]

(C) Installations Covered.

This *Code* covers the installation and removal of electrical conductors, equipment, and raceways; signaling and communications conductors, equipment, and raceways; and optical fiber cables for the following:

(1) Public and private premises, including buildings, structures, mobile homes, recreational vehicles, and floating buildings

(2) Yards, lots, parking lots, carnivals, and industrial substations

(3) Installations of conductors and equipment that connect to the supply of electricity

(4) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center

(5) Installations supplying shore power to ships and watercraft in marinas and boatyards, including monitoring of leakage current

(6) Installations used to export electric power from vehicles to premises wiring or for bidirectional current flow

(7) Telecommunication installations, cabling, and transmission facilities outside buildings that are essential for community resilience during major regional contingencies

Statement of Problem and Substantiation for Public Input

This proposal is the "converse" of related proposal under the "Not Covered" section below. Friends of the National Electrical Code need to expand the scope of the NEC to supplement state and federal regulatory actions focused on improving community resilience in major regional contingencies. Admittedly, this proposal is a big step -- perhaps as large an expansion of scope as the recent step-wise expansion of the scope of ASHRAE 90.1 from building premises to the spaces BETWEEN buildings. (As of January 2023 the new title is "Energy Efficiency Standard for *SITES AND* Buildings Except Low-Rise Residential Buildings." It is an ambitious expansion of scope which should enlighten consideration of of this proposal.

Extended power outages can be managed but avoidance, mitigation and return to normal is more difficult if the affected community does not have effective communication with the utility, with other community members and possibly local emergency management centers. While many telecommunication utilities deploy mobile facilities for cellular and broadband access, some do not; or impeded in their attempt to keep pace with demand when communication is needed most.

Fire Marshals with broad authority, electrical and telecommunication professionals with knowledge of local networks, can hasten management and recovery more effectively than state and federal agencies that only incorporate by reference the NEC but they need some language in the NEC that gives them some flexibility, There may well be a better way to accomplish this -- placement of a statement in the Not Covered part of this section, for example -- but this proposal is intended to at least get the issue discussed.

Submitter Information Verification

Submitter Full Name: Michael Anthony
Organization: Standards Michigan LLC
Affiliation: StandardsMichigan.COM
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 19:46:29 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Signaling and communication conductors and equipment are covered in the main paragraph. The proposed text would conflict with 90.2(D)(4) and (5). The Panel concludes that “state and federal agencies that

reference the NEC need some language for flexibility" has not been substantiated.

Public Input No. 478-NFPA 70-2023 [Section No. 90.2(C)]

(C) Installations Covered.

This *Code* covers the installation, maintenance, reconditioning, servicing, and removal of electrical conductors, equipment, and raceways; signaling and communications conductors, equipment, and raceways; and optical fiber cables for the following:

(1) Public and private premises, including buildings, structures, mobile homes, recreational vehicles, and floating buildings

(2) Yards, lots, parking lots, carnivals, and industrial substations

(3) Installations of conductors and equipment that connect to the supply of electricity

(4) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center

(5) Installations supplying shore power to ships and watercraft in marinas and boatyards, including monitoring of leakage current

(6) Installations used to export electric power from vehicles to premises wiring or for bidirectional current flow

Statement of Problem and Substantiation for Public Input

Requirements related to maintenance, reconditioning, and servicing are within the NEC yet such activities are not permitted by the "installations covered" requirements in this subdivision. This proposed changed would allow such activities.

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 16 11:02:13 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9273-NFPA 70-2024
Statement: textThe text was revised in 90.2(C) in the main paragraph to add maintenance, reconditioning, and servicing to correlate with such requirements in this Code.

Public Input No. 718-NFPA 70-2023 [Sections 90.2(C), 90.2(D)]

Sections 90.2(C), 90.2(D)

(C) Installations Covered.

This *Code* covers the installation and removal of electrical conductors, equipment, and raceways; signaling and communications conductors, equipment, and raceways; and optical fiber cables for the following unless exempted by 90.2(D) :

(1) Public and private premises, including buildings, structures, mobile homes, recreational vehicles, ~~and floating buildings~~
~~Yards,~~

(2) floating buildings, roadways, shipping centers, and railway infrastructure (such as train station areas and track-side lighting used for non-signaling purposes)

(3) Electrical yards, property lots, parking lots, carnivals, and industrial substations

(4) Installations of conductors and equipment that connect to the supply of electricity

(5) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center

(6) Installations supplying shore power ~~to ships and watercraft in marinas and boatyards,~~ from the electrical grid to ships, recreational vehicles, and other vehicle that directly use the mains frequency, or from the electrical grid to any converter (whether fastened-in-place or mobile) that supplies conditioned shore power to other watercraft (certain small boats), aircraft, spacecraft, or any other vehicle that does not have the electrical phase of its internal circuitry synchronized with the grid, including monitoring of leakage current

(7) Installations used to charge electric vehicles from the mains, export electric power from vehicles to premises wiring, or for bidirectional current flow

(D) Installations Not Covered.

This *Code* does not cover the following:

(1) Installations in ships, watercraft other than floating buildings, railway rolling stock, amusement ride vehicles, aircraft, spacecraft, or automotive vehicles other than mobile homes, recreational vehicles, and ~~recreational vehicles~~ vehicles with on-board AC receptacles used for EVPE

Informational Note: Although the scope of this *Code* indicates that the *Code* does not cover installations in ships, portions of this *Code* are incorporated by reference into Title 46, Code of Federal Regulations, Parts 110–113.

(2) Installations underground in mines and self-propelled mobile surface mining machinery and its attendant electrical trailing cable

(3) Installations of railways ~~for~~ and roadway trolley wire systems for generation, transformation, transmission, energy storage, or distribution of power used exclusively for operation of rolling stock ~~or installations used~~ ; or installations used exclusively for signaling and communications purposes for railways and roadway trolley vehicle lanes

(4) Installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations

(5) Installations under the exclusive control of an electric utility ~~where~~ (legally defined classification) where such installations

(6) Consist of service drops or service laterals, and associated metering, or

(7) Are on property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy, or

(8) Are located in legally established easements or rights-of-way, or

(9) Are located by other written agreements either designated by or recognized by public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations. These written agreements shall be limited to installations for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy where legally established easements or rights-of-way cannot be obtained. These installations shall be limited to federal lands, Native American reservations through the U.S. Department of the Interior Bureau of Indian Affairs, military bases, lands controlled by port authorities and state agencies and departments, and lands owned by railroads.

Informational Note to (4) and (5): Examples of utilities may include those entities that are typically designated or recognized by governmental law or regulation by public service/utility commissions and that install, operate, and maintain electric supply (such as generation, transmission, or distribution systems) or communications systems (such as telephone, CATV, Internet, satellite, or data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

Statement of Problem and Substantiation for Public Input

I made the intent of the National Electric Code less ambiguous by refining and elaborating on the examples. Also made it clear that vehicles with on-board AC receptacles used for EVPE do fall under the scope of the NEC. This time, clarified that installations feeding the grid to the power converters (such as frequency converters and inverters) that in turn supply conditioned shore power to vehicles (especially large aircraft, which are numerous and exclusively use 400 Hz) besides large maritime vessels and regular RVs also count.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 25 23:15:00 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The recommendation does not adequately substantiate that what is covered and not covered by the NEC is not clear. Further, the recommendation does not improve clarity or usability.

Public Input No. 1558-NFPA 70-2023 [New Section after 90.2(D)]

(E) Maintenance.

Maintenance of electrical equipment as covered in this *Code* shall be in accordance with industry standards.

Informational Note: Hazards often occur because of improper or lack of maintenance of electrical equipment, that was otherwise initially installed free of hazard. See electrical equipment manufacturer's installation instructions and NFPA 70B, *Standard for Maintaining Electrical Equipment* for more information on proper maintenance of electrical equipment.

Statement of Problem and Substantiation for Public Input

The NEC® has long been regarded as the minimum electrical installation requirements code. The 2023 edition of the NEC® Section 110.17 now incorporates maintenance element into the NEC, as such, Section 90.2 Use and Application, should recognize maintenance as being covered under the application of the NEC rules. Incorporating an informational note pointing to NFPA 70B serves two purposes:

(1) it builds awareness that the document has been elevated to the Standard.
(2) It points to the proper standard and manufacture instructions as the governing document in compliance with NEC maintenance provisions.

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 14:26:04 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Inadequate substantiation has been provided to justify the need for a general requirement and an Informational Note that specifies how maintenance must be accomplished.

Public Input No. 1715-NFPA 70-2023 [Section No. 90.2(D)]

(D) Installations Not Covered.

This *Code* does not cover the following:

(1) Installations in ships, watercraft other than floating buildings, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles, and receptacles for off-board utilization equipment of electric vehicles.

Informational Note: Although the scope of this *Code* indicates that the *Code* does not cover installations in ships, portions of this *Code* are incorporated by reference into Title 46, Code of Federal Regulations, Parts 110–113.

(2) Installations underground in mines and self-propelled mobile surface mining machinery and its attendant electrical trailing cable

(3) Installations of railways for generation, transformation, transmission, energy storage, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communications purposes

(4) Installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations

(5) Installations under the exclusive control of an electric utility where such installations

(6) Consist of service drops or service laterals, and associated metering, or

(7) Are on property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy, or

(8) Are located in legally established easements or rights-of-way, or

(9) Are located by other written agreements either designated by or recognized by public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations. These written agreements shall be limited to installations for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy where legally established easements or rights-of-way cannot be obtained. These installations shall be limited to federal lands, Native American reservations through the U.S. Department of the Interior Bureau of Indian Affairs, military bases, lands controlled by port authorities and state agencies and departments, and lands owned by railroads.

Informational Note to (4) and (5): Examples of utilities may include those entities that are typically designated or recognized by governmental law or regulation by public service/utility commissions and that install, operate, and maintain electric supply (such as generation, transmission, or distribution systems) or communications systems (such as telephone, CATV, Internet, satellite, or data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

Statement of Problem and Substantiation for Public Input

Section 625.60 AC Receptacles Outlets Used for EVPE, so violates both the scope of the NEC, and UL 9741. Since CMP-12 did not revise 625.60 per our input and comments in the last cycle, presumably the scope statements should recognize the existence of that section. We point out that the standard for EVPE (UL 9741, actually currently Bi-Directional, not just EVPE) relates to connection via the EV Connector (EV Plug and Inlet, eg. SAE J-1772), not standard straight-blade receptacles of the type described in section 210.21 and article 406 (eg. 5-15R), and many types of cars and light trucks have onboard inverters and receptacles for off-board utilization equipment (Vehicle-to-load can be a form of EV Power Export, but it's not unique to EVs), so if the NEC scope is to be expanded it should cover all such receptacles, even if we think that is unenforceable. Actual EVPE/BiDi is already noted in 90.2(C). We have also previously pointed out that Park Trailers are covered by Article 552 but not listed, so it may be appropriate to add them also since mobile homes and recreational vehicles are already mentioned.

Related Public Inputs for This Document

Related Input	Relationship

Public Input No. 1803-NFPA 70-2023 [Section No. 625.60]

Submitter Information Verification

Submitter Full Name: Kevin Cheong
Organization: Chargepoint Canada Inc.
Affiliation: ChargePoint Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jul 29 20:29:54 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed text conflicts with 90.2(C)(6) and the installation requirements for ac receptacle outlets used for EVPE covered in 625.60(A)(B)(C) and (D). The Panel concludes that the added text would add confusion to the Code.

Public Input No. 411-NFPA 70-2023 [Section No. 90.2(D)]

(D) Installations Not Covered.

This *Code* does not cover the following:

(1) Installations in ships, watercraft other than floating buildings, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles

Informational Note: Although the scope of this *Code* indicates that the *Code* does not cover installations in ships, portions of this *Code* are incorporated by reference into Title 46, Code of Federal Regulations, Parts 110–113.

(2) Installations underground in mines and self-propelled mobile surface mining machinery and its attendant electrical trailing cable

(3) Installations of railways for generation, transformation, transmission, energy storage, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communications purposes

(4) Installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations

(5) Installations under the exclusive control of an electric utility where such installations

(6) Consist of

~~service drops~~

a. utility drops or

~~service laterals~~

a. utility laterals , and associated metering, or

b. Are on property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy, or

c. Are located in legally established easements or rights-of-way, or

d. Are located by other written agreements either designated by or recognized by public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations. These written agreements shall be limited to installations for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy where legally established easements or rights-of-way cannot be obtained. These installations shall be limited to federal lands, Native American reservations through the U.S. Department of the Interior Bureau of Indian Affairs, military bases, lands controlled by port authorities and state agencies and departments, and lands owned by railroads.

Informational Note to (4) and (5): Examples of utilities may include those entities that are typically designated or recognized by governmental law or regulation by public service/utility commissions and that install, operate, and maintain electric supply (such as generation, transmission, or distribution systems) or communications systems (such as telephone, CATV, Internet, satellite, or data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

Statement of Problem and Substantiation for Public Input

This PI is associated with several other PIs to recommend a global change from “service drop” to “utility drop” and from “service lateral” to “utility lateral.” “Service drop” appears 23 times in the Code and “service lateral” appears 15 times. There are 11 definitions that begin with the word ‘service.’ Of these, 9 are customer owned and only “service drop” and “service lateral” are utility owned and, therefore, outside the scope of the Code (as indicated by this section). “service drops” and “service laterals” are not service conductors as they do not fit the definition. Confining the word “service” to only those items that are customer owned would clear up much confusion on this topic. Appendix A shows UL 523 as having the title “telephone service drop wire” and the UL standard does, in fact, have that title. However, the text of UL 523 defines this wire as customer owned and Article 805 refers to this wire as a “drop wire.”

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]	Global change
Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]	Global change
Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po...]	Global change
Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]	Global change
Public Input No. 416-NFPA 70-2023 [Section No. 800.44(A)(4)]	Global change
Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]	Global change
Public Input No. 418-NFPA 70-2023 [Section No. 701.12(F)]	Global change
Public Input No. 419-NFPA 70-2023 [Section No. 770.44(A)(4)]	Global change
Public Input No. 420-NFPA 70-2023 [Section No. 770.44(B)]	Global change
Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]	Global change
Public Input No. 422-NFPA 70-2023 [Section No. 230.40]	Global change
Public Input No. 423-NFPA 70-2023 [Section No. 250.24(A)(1)]	Global change
Public Input No. 424-NFPA 70-2023 [Section No. 250.24(F)]	Global change
Public Input No. 425-NFPA 70-2023 [Section No. 250.64(D)(1)]	Global change
Public Input No. 426-NFPA 70-2023 [Section No. 250.66 [Excluding any Sub-Sections]]	Global change
Public Input No. 412-NFPA 70-2023 [Definition: Service Drop.]	
Public Input No. 413-NFPA 70-2023 [Definition: Service-Entrance Conductors.]	
Public Input No. 414-NFPA 70-2023 [Definition: Distribution Point (Center Yard Pole) (Meter Po...]	
Public Input No. 415-NFPA 70-2023 [Definition: Service Lateral.]	
Public Input No. 416-NFPA 70-2023 [Section No. 800.44(A)(4)]	
Public Input No. 417-NFPA 70-2023 [Section No. 700.12(F)]	
Public Input No. 418-NFPA 70-2023 [Section No. 701.12(F)]	
Public Input No. 419-NFPA 70-2023 [Section No. 770.44(A)(4)]	
Public Input No. 420-NFPA 70-2023 [Section No. 770.44(B)]	
Public Input No. 421-NFPA 70-2023 [Section No. 230.24(A)]	
Public Input No. 422-NFPA 70-2023 [Section No. 230.40]	
Public Input No. 423-NFPA 70-2023 [Section No. 250.24(A)(1)]	
Public Input No. 424-NFPA 70-2023 [Section No. 250.24(F)]	
Public Input No. 425-NFPA 70-2023 [Section No. 250.64(D)(1)]	
Public Input No. 426-NFPA 70-2023 [Section No. 250.66 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sat Mar 04 16:18:47 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Installations not covered that are under the exclusive control of an electric utility where “service drops” and “service laterals” are defined as conductors between the utility electric supply and the service point. Stating that “items that are customer owned would clear up much confusion” has not been substantiated.

Public Input No. 4162-NFPA 70-2023 [Section No. 90.2(D)]

(D) Installations Not Covered.

This *Code* does not cover the following:

(1) Installations in ships, watercraft other than floating buildings, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles

Informational Note: Although the scope of this *Code* indicates that the *Code* does not cover installations in ships, portions of this *Code* are incorporated by reference into Title 46, Code of Federal Regulations, Parts 110–113.

(2) Installations underground in mines and self-propelled mobile surface mining machinery and its attendant electrical trailing cable

(3) Installations of railways for generation, transformation, transmission, energy storage, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communications purposes

(4) ~~Installations of~~ Except as required by the Authority Having Jurisdiction for the purpose of community safety, installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations

(5) Installations under the exclusive control of an electric utility where such installations

(6) Consist of service drops or service laterals, and associated metering, or

(7) Are on property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy, or

(8) Are located in legally established easements or rights-of-way, or

(9) Are located by other written agreements either designated by or recognized by public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations. These written agreements shall be limited to installations for the purpose of communications, metering, generation, control, transformation, transmission, energy storage, or distribution of electric energy where legally established easements or rights-of-way cannot be obtained. These installations shall be limited to federal lands, Native American reservations through the U.S. Department of the Interior Bureau of Indian Affairs, military bases, lands controlled by port authorities and state agencies and departments, and lands owned by railroads.

Informational Note to (4) and (5): Examples of utilities may include those entities that are typically designated or recognized by governmental law or regulation by public service/utility commissions and that install, operate, and maintain electric supply (such as generation, transmission, or distribution systems) or communications systems (such as telephone, CATV, Internet, satellite, or data services). Utilities may be subject to compliance with codes and standards covering their regulated activities as adopted under governmental law or regulation. Additional information can be found through consultation with the appropriate governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission.

Statement of Problem and Substantiation for Public Input

Friends of the National Electrical Code need to expand the scope of the NEC to supplement state and federal regulatory actions focused on improving community resilience in major regional contingencies. Admittedly, this proposal is a big step -- perhaps as large an expansion of scope as the recent step-wise expansion of the scope of ASHRAE 90.1 from building premises to the spaces BETWEEN buildings. (As of January 2023 the new title is "Energy Efficiency Standard for *SITES AND* Buildings Except Low-Rise Residential Buildings." It is an ambitious expansion of scope which should enlighten consideration of of this proposal.

Extended power outages can be managed but avoidance, mitigation and return to normal is more difficult if the affected community does not have effective communication with the utility, with other community members and possibly local emergency management centers. While many telecommunication utilities deploy mobile facilities for cellular and broadband access, some do not; or impeded in their attempt to keep pace with demand when communication is needed most.

Fire Marshals with broad authority, electrical and telecommunication professionals with knowledge of local networks, can hasten management and recovery more effectively than state and federal agencies that only incorporate by reference the

NEC but they need some language in the NEC that gives them some flexibility, There may well be a better way to accomplish this -- placement of a more direct statement about scope elsewhere in the NEC, for example -- but this proposal is intended to at least get the issue discussed.

Submitter Information Verification

Submitter Full Name: Michael Anthony
Organization: Standards Michigan LLC
Affiliation: StandardsMichigan.COM
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 19:09:12 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed text “except as required by the Authority Having Jurisdiction” conflicts with what the Code does not cover. The panel concludes that “expanding the scope of the NEC to supplement state and federal regulatory actions on improving community resiliency” has not been substantiated.

Public Input No. 190-NFPA 70-2023 [Section No. 90.2(F)]

~~**(F)** Special Permission.~~

~~The authority having jurisdiction for enforcing this *Code* may grant exception for the installation of conductors and equipment that are not under the exclusive control of the electric utilities and are used to connect the electric utility supply system to the service conductors of the premises served, provided such installations are outside a building or structure, or terminate inside at a readily accessible location nearest the point of entrance of the service conductors.~~

Statement of Problem and Substantiation for Public Input

There is no need for 90.2(F) as these requirements are already addressed in 90.4. This is a redundant requirement. There is nothing addressed in 90.2(F) that is not addressed in 90.4(A), (B), or (C).

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 18 10:57:36 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8866-NFPA 70-2024
Statement: List item (F) is deleted as these requirements are addressed in 90.4.

Public Input No. 1559-NFPA 70-2023 [Section No. 90.3]

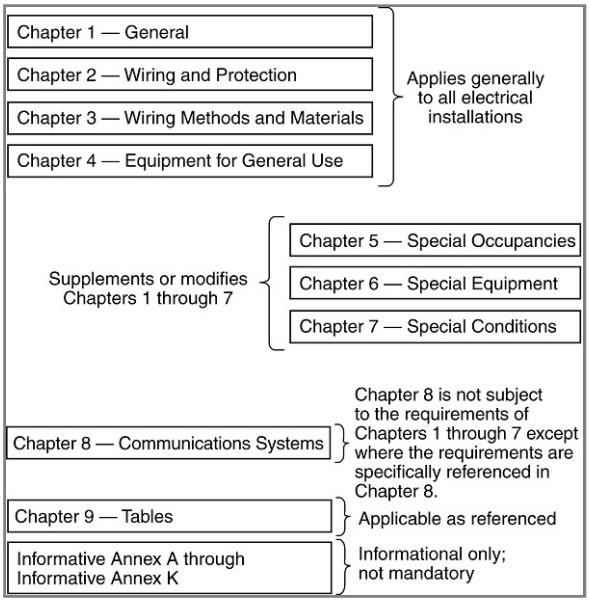
90.3 Code Arrangement and Application .

This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally. Chapters 5, 6, 7 and ~~7 apply to special occupancies, special equipment~~ 8 apply to specific occupancies and locations, specific equipment , or other ~~special conditions and~~ specific conditions and systems, and they may supplement or modify the requirements in Chapters 1 through ~~7 .Chapter~~ 8 ~~covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter~~ 8 .

Chapter 9 consists of tables that are applicable as referenced.

Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.

Figure 90.3 Code Arrangement.



Additional Proposed Changes

File Name	Description	Approved
Figure_90.3_Graphic.jpeg		

Statement of Problem and Substantiation for Public Input

Section 90.3 covers far more than just the arrangement of the NEC. It covers both the arrangement and more importantly the application of the Code rules, from a high-level perspective. It is vitally important for training organizations to understand and utilize the proven concepts that exist in 90.3 and have for over 70 years. They have stood the test of time and are still valid and functional today. The proposed revisions are intended to include the term “application” in the title and to revise some of the chapter titles to remove the term “special” and more accurately reflect what is covered within those chapters. At the time these chapter titles were developed in the 1930s and 1940s, these chapters did cover items that were considered “special.” This is no longer the case and these requirements in these chapters are now commonplace. The proposed revisions are not intended to impact the functional aspects of applying the NEC in any way, but rather to enhance it and promote clarity. The changes proposed to the titles of chapters 5, 6, and 7 are intended to also reflect global revisions to change these titles in the table of contents for correlation. The revisions to these titles will also more accurately reflect what is included within each chapter while simultaneously continuing to allow for growth and expansion of the Code in the future.

The recommendation is to remove the term “special” and more accurately reflect what is covered within those chapters. At the time these chapter titles were developed in the 1930s and 1940s, these chapters did cover items that were considered “special.” This is no longer the case and these requirements in these chapters are now commonplace. The proposed revisions are not intended to impact the functional aspects of applying the NEC in any way, but rather to

enhance it and promote clarity. The changes proposed to the titles of chapters 5, 6, and 7 are intended to also reflect global revisions to change these titles in the table of contents for correlation. The revisions to these titles will also more accurately reflect what is included within each chapter while simultaneously continuing to allow for growth and expansion of the Code in the future. Companion Public Inputs are being submitted to relocate articles that do not belong in these chapters, such as articles 590 and 770.

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 14:39:57 EDT 2023
Committee: NEC-P01

Committee Statement

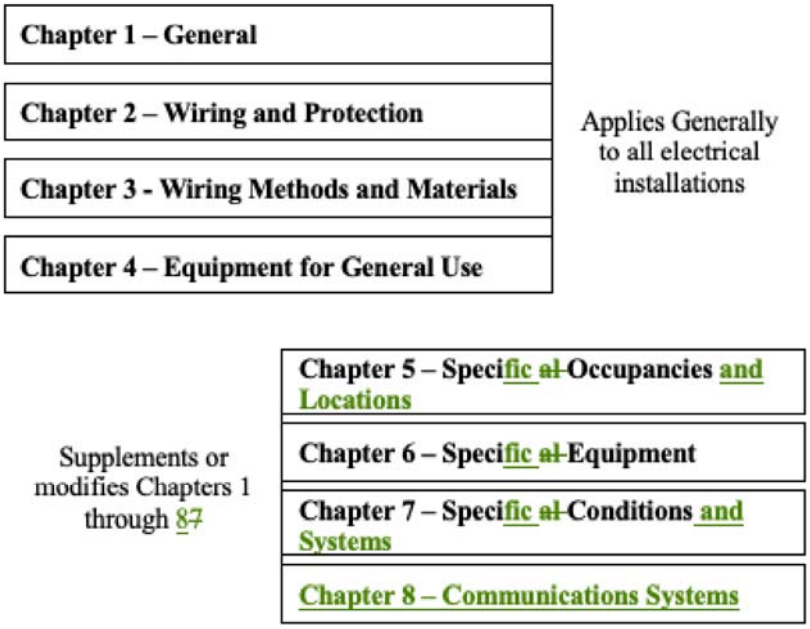
Resolution: FR-9191-NFPA 70-2024

Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.


Chapter 1 – General
Chapter 2 – Wiring and Protection
Chapter 3 - Wiring Methods and Materials
Chapter 4 – Equipment for General Use
Applies Generally to all electrical installations
Chapter 5 – Specific al Occupancies and Locations
Chapter 6 – Specific al Equipment
Chapter 7 – Specific al Conditions and Systems
Chapter 8 – Communications Systems
Supplements or modifies Chapters 1 through 87
Chapter 8 – Communications Systems
Chapter 8 is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8
Chapter 9 – Tables
Applicable as referenced
Informative Annex A through Informative Annex K
Informational only; not mandatory

Public Input No. 191-NFPA 70-2023 [Section No. 90.3]

90.3 Code Arrangement.

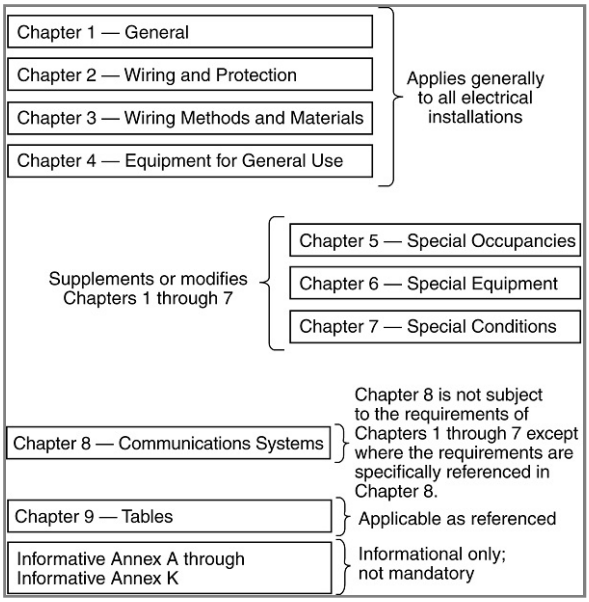
This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally. Chapters 5, 6, and 7 apply to special occupancies, special equipment, ~~or other special~~ or special conditions and may supplement or modify the requirements in Chapters 1 through 7.

Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.

Chapter 9 consists of tables that are applicable as referenced.

Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.

Figure 90.3 Code Arrangement.



Statement of Problem and Substantiation for Public Input

Remove the word "other" there are no other special conditions described in this Section. This will also correlate with Figure 90.3.

Submitter Information Verification

Submitter Full Name: Mark Christian
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 18 15:11:29 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9191-NFPA 70-2024
Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.

Public Input No. 3314-NFPA 70-2023 [Section No. 90.3]

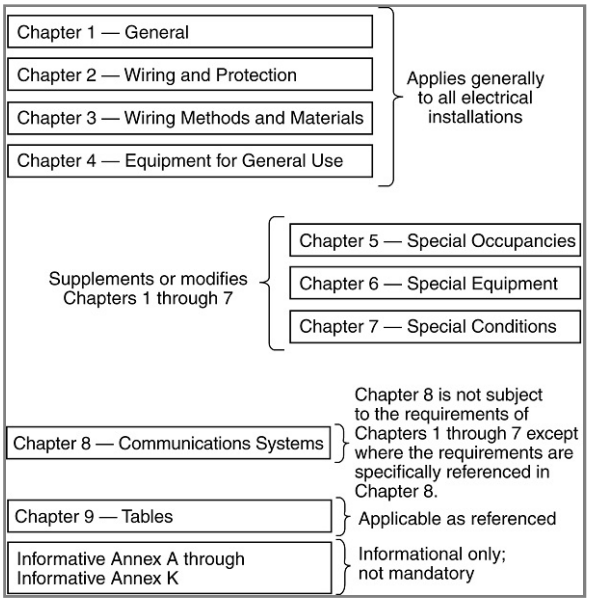
90.3 Code Arrangement.

This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally. Chapters 5, 6, ~~and~~ 7 and 8 apply to special occupancies, special equipment, or other special conditions and may supplement or modify the requirements in Chapters 1 through ~~7 .Chapter~~ 8 ~~covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter~~ 8 .

Chapter 9 consists of tables that are applicable as referenced.

Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.

Figure 90.3 Code Arrangement.



Statement of Problem and Substantiation for Public Input

The intent of this Public Input is to allow the reorganization of the limited energy articles. The reorganization no longer requires that the communications systems articles be independent from chapters 1-7.

Submitter Information Verification

Submitter Full Name: g. Scott Harding
Organization: F.B. Harding, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 31 17:25:55 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9191-NFPA 70-2024
Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.

Public Input No. 3465-NFPA 70-2023 [Section No. 90.3]

90.3 Code Arrangement.

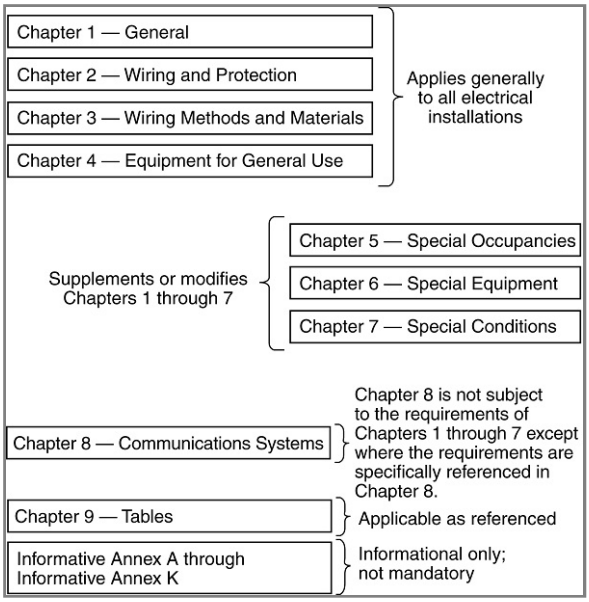
This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally. Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions and may supplement or modify the requirements in Chapters 1 through 7.

Chapter 8 covers communications systems~~ and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8~~ .

Chapter 9 consists of tables that are applicable as referenced.

Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.

Figure 90.3 Code Arrangement.



Statement of Problem and Substantiation for Public Input

Input proposes to apply applicable requirements in Chapters 1-7 to communications systems. Those systems have previously been exempt from requirements in Chapters 1-7 unless specifically referenced in Chapter 8. That concept appears to be based on PAST practices where communications systems were installed, in premises wiring and in rights of way by communication utility companies. Todays premises communications wiring are installed like all other premises wiring, by other than utility companies. It should also be noted that list item (4) in 90.2(D) already excludes wiring and equipment under the exclusive control communication utilities in specific locations. Beyond the point of demarcation, wiring and associated hazards for these systems are identical. Current exclusion of these requirements for Chapter 8 systems while having different requirements for other energy-limited systems make enforcement very difficult and different when the hazards are identical.

Submitter Information Verification

Submitter Full Name: Donald Cook
Organization: Dewberry/Edmonds Engineering
Affiliation: self
Street Address:
City:
State:
Zip:
Submittal Date: Sun Sep 03 15:28:32 EDT 2023

Committee: NEC-P01

Committee Statement

Resolution: FR-9191-NFPA 70-2024

Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.

Public Input No. 4099-NFPA 70-2023 [Section No. 90.3]

90.3 Code Arrangement.

~~This~~
The Code is

~~divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally~~
arranged as follows:

1. Article 90 - Introduction

2. Chapters 1-4, 13 and 14 – General Requirements

3. Chapters 5, 6, and 7

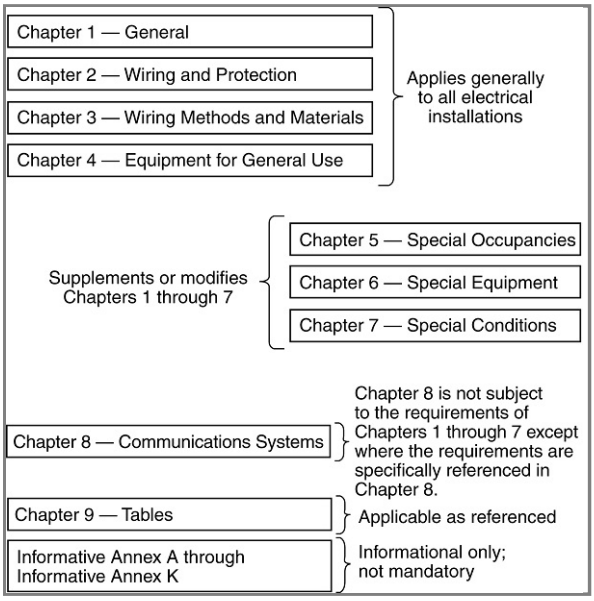
~~apply to special occupancies, special equipment, or other special conditions and may supplement or modify the requirements in Chapters 1 through 7.~~

~~Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.~~

~~Chapter 9 consists of tables that are applicable as referenced.~~

~~Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.~~

~~**Figure 90.3 Code Arrangement.**~~



– Supplemental or amendatory requirements

4. Chapter 9 – Tables

5. Informative Annexes

Additional Proposed Changes

File Name	Description	Approved
90.3_V3_.pdf	Proposed 90.3 Table	

Statement of Problem and Substantiation for Public Input

The structural arrangement of the NEC is currently under consideration. It is recommended that the CMP consider the NEC CC Wire Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?”, published earlier this year by NFPA. This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled. The proposed 90.3 change simplifies the current NEC structure, and embraces the proposed future NEC structure changes.

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 16:38:28 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9191-NFPA 70-2024

Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.

90.3 (2026 NEC)

Introduction

Definitions and General Requirements
Chapter 1

Wiring and Protection
Chapter 2

Wiring Methods and Materials
Chapter 3

Equipment for General Wiring
Chapter 4

Wiring and Protection for Systems Over 1000 Vac, 1500 Vdc
Chapter 13

Limited Energy Systems
Chapter 14

Applies generally to electrical installations

Special Occupancies
Chapter 5

Special Equipment
Chapter 6

Special Conditions
Chapter 7

Supplemental or Amendatory requirements

Tables
Chapter 9

Applicable as referenced

Informative Annex A through Informative Annex K

Information only; not mandatory

Public Input No. 919-NFPA 70-2023 [Section No. 90.3]

90.3 Code Arrangement.

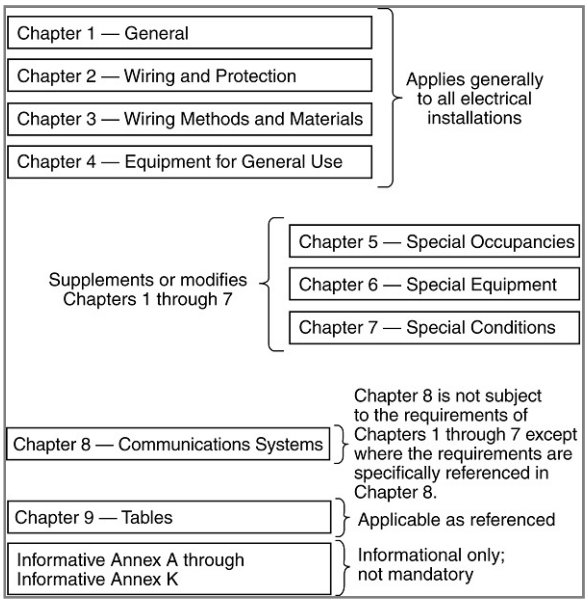
This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally. Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions and may supplement or modify the requirements in Chapters 1 through 7.

Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.

Chapter 9 consists of tables that are applicable as referenced.

Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.

Figure 90.3 Code Arrangement.



Statement of Problem and Substantiation for Public Input

Terra did not allow me to open the Figure 90.3 so I am attempting to describe my recommended revision the best that I can. The information provided in the bracketed information in Figure 90.3 for Chapters 1, 2, 3 and 4 is not accurate as these chapters do not apply generally to Chapter 8. Adding clarification that Chapters 1 through 4 only apply generally to Chapters 1 through 7 makes it clear that Chapters 1 through 4 do not apply generally to Chapter 8. The explanatory text in this figure conflicts with the second paragraph of 90.3.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 920-NFPA 70-2023 [Section No. 90.3]	Similar concept for accuracy and correlation.
Public Input No. 920-NFPA 70-2023 [Section No. 90.3]	

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:

State:
Zip:
Submittal Date: Fri Jun 02 13:31:11 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9191-NFPA 70-2024

Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.

Public Input No. 920-NFPA 70-2023 [Section No. 90.3]

90.3 Code Arrangement.

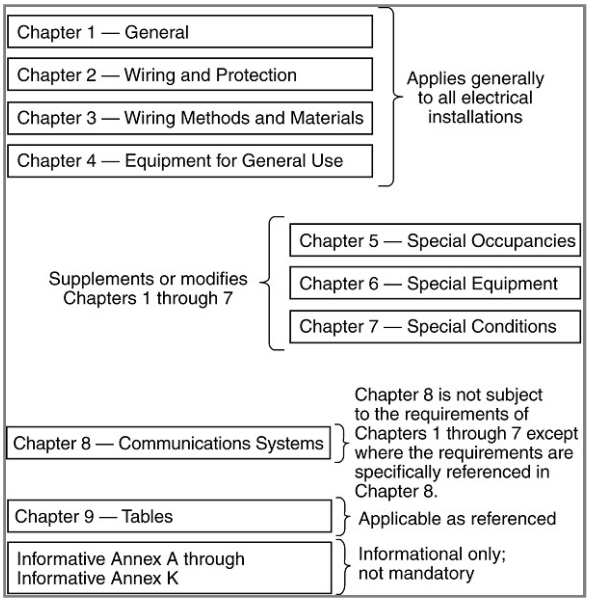
This *Code* is divided into the introduction and nine chapters, as shown in Figure 90.3. Chapters 1, 2, 3, and 4 apply generally to Chapters 1 through 7 . Chapters 5, 6, and 7 apply to special occupancies, special equipment, or other special conditions and may supplement or modify the requirements in Chapters 1 through 7.

Chapter 8 covers communications systems and is not subject to the requirements of Chapters 1 through 7 except where the requirements are specifically referenced in Chapter 8.

Chapter 9 consists of tables that are applicable as referenced.

Informative annexes are not part of the requirements of this *Code* but are included for informational purposes only.

Figure 90.3 Code Arrangement.



Statement of Problem and Substantiation for Public Input

Section 90.3 is not accurate as it is presently written as Chapters 1, 2, 3 and 4 do not apply generally to Chapter 8. The existing requirement in the first paragraph of 90.3 conflicts with the second paragraph of 90.3 if this clarification is not added.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 919-NFPA 70-2023 [Section No. 90.3]	This is the same concept requiring clarification.
Public Input No. 919-NFPA 70-2023 [Section No. 90.3]	

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jun 02 13:41:19 EDT 2023

Committee: NEC-P01

Committee Statement

Resolution: FR-9191-NFPA 70-2024

Statement: The text in 90.3 is modified to remove the independence of Chapter 8. The reorganization no longer requires that the communications systems articles be independent from Chapters 1-7.

The titles of the chapters were changed from “special” to “specific” to accurately reflect what is covered within those chapters.

The changes to 90.3 simplifies the current NEC structure, and positions the proposed future NEC structure changes outlined in NEC CC White Paper “Keeping the NEC® Relevant – Is Now the Time to Modernize?” This White Paper provides a roadmap for a future Code structure to address the everchanging landscape of how electrical power is generated, delivered, used, and controlled.

The Panel recognizes that additional chapters are under the purview of the NEC Correlating Committee.

Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]

(A) Application.

This *Code* is intended to be suitable for mandatory application by governmental bodies that exercise legal jurisdiction over electrical installations, including signaling and communications systems, and for use by insurance inspectors, and for the approval of prefabricated electrical installations which may or may not be performed at the final installation site .

Informational Note: See *National Electrical Installation Standard(NEIS™)* NECA 5, *Recommended Practice for Prefabrication of Electrical Installation for Construction*, and other ANSI-approved installation standards for information on accepted industry prefabrication practices.

Statement of Problem and Substantiation for Public Input

With the increased industrialization of the construction industry, Codes and Standards need to recognized prefabrication as a valid code compliant installation practice that requires inspection/approval.

- Add: “In addition to approval of prefabricated electrical installations (on or off site)”

Add informational note referencing NECA 5-2022, Recommended Practice for Prefabrication of Electrical Installations in Construction.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]	
Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]	
Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]	
Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]	
Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]	
Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 14:49:07 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: This Code, when adopted by governmental bodies for legal jurisdiction over electrical installations, would apply to prefabricated electrical systems whether installed on or off site and subject to approval by the AHJ. The informational note does not support 90.4(A) Application.

Public Input No. 337-NFPA 70-2023 [Section No. 90.4(B)]

(B) Interpretations.

The authority having jurisdiction for enforcement of the Code has the responsibility for making interpretations of the rules, for deciding on the approval ~~of equipment and materials~~ of field-installed materials and equipment in addition to prefabricated materials and equipment , and for granting the special permission contemplated in a number of the rules.

Statement of Problem and Substantiation for Public Input

Prefabrication of electrical installations are becoming very common and required inspections are still necessary whether the fabrication installation is remote or onsite. Including this as a requirement in this section will assist authorities having jurisdiction with accomplishing necessary scheduled inspections and approvals to facilitate project progress and minimize delays related to AHJs not being able or schedule to perform their job.

Submitter Information Verification

Submitter Full Name: Laurie Myers
Organization: Puget Sound Electrical JATC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Feb 15 15:54:58 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The general application of 90.4(B) for deciding on the “approval of equipment and materials” applies to prefabricated whether the installation is remote or onsite. The submitter’s statements on “project delays” and “AHJ’s not able to schedule” have not been substantiated.

Public Input No. 4165-NFPA 70-2023 [Section No. 90.4(D)]

(D) New Products, Constructions, or Materials.

This *Code* may require new products, constructions, or materials that may not yet be available at the time the *Code* is adopted. In such event, the authority having jurisdiction may permit the use of the products, constructions, or materials that ~~comply~~ deemed suitable with the most recent previous edition of this *Code* adopted by the jurisdiction. 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 test ing 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 No. 1 : Additional documentation for equipment might include certificates demonstrating compliance with applicable equipment standards, indicating special conditions of use, and providing other pertinent information.

Informational Note No. 2: See Informative Annex H, Administration and Enforcement, for a model of guidelines that can be used to create an electrical inspection and enforcement program and to adopt *NFPA 70, National Electrical Code*.

Statement of Problem and Substantiation for Public Input

The subsection doesn't provide guidance on how to evaluate the suitability of new new equipment. I borrowed the language from Chapter 5, Article 500, section 500,8 which provides guidance and clarity for AHJ to approve new equipment or technologies.

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 19:13:47 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Guidance for evaluating and determining the suitability of new equipment, installation and use, and listing is located in 110.3(A)(B) and (C).

Public Input No. 1351-NFPA 70-2023 [New Section after 90.7]

Insert a new 90.7 and renumber the remaining:

90.7 Erratas and Tentative Interim Amendments (TIA)

(A) Erratas.

Erratas issued to this Code and reference standards shall apply to this Code and reference standards at the time of issuance of the errata by NFPA. Erratas issued to this Code and reference standards shall be considered part of the requirements of this document.

(B) Tentative Interim Amendments (TIA).

Tentative interim amendments issued by NFPA to this Code and reference standards shall apply to this Code and reference standards as the time of issuance of the tentative interim amendment. Tentative interim amendments issued to this Code and reference standards shall be considered part of the requirements of this document.

Informational note no. 1:
Recognition of NFPA issued Tentative Interim Amendments (TIAs) is imperative as the applicable NFPA Technical Committee has determined that one or more of the following emergency conditions exist in an NFPA Code or Standard:

(a) The NFPA Code or Standard contains an error or an omission that was overlooked during a regular revision process.

(b) The NFPA Code or Standard contains a conflict within the NFPA Code or Standard or with another NFPA Code or Standard. (c) The proposed TIA intends to correct a previously unknown existing hazard.

(d) The proposed TIA intends to offer to the public a benefit that would lessen a recognized (known) hazard or ameliorate a continuing dangerous condition or situation.

(e) The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public.

(f) The proposed TIA intends to correct a circumstance in which the revised NFPA Code or Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification for the action.

See the NFPA Regulations Governing the Development of NFPA Standards for information on the processing of Tentative Interim Amendments.

The Authority Having Jurisdiction should review should review their adoption processes as it applies to Tentative Interim Amendments to ensure the legal standing of Tentative Interim Amendments under this section.

Statement of Problem and Substantiation for Public Input

Erratas and Tentative Interim Amendments are key components of the model code promulgation process and should be recognized within Article 90. Erratas are strictly editorial corrections that are published by NFPA under the authority of the Regulations Governing the Development of NFPA Standards. These editorial changes are important to incorporate into the Code as they are editorial corrections the documents that can the correct reading of the impact text. Tentative Interim Amendments are, by definition and regulation, emergency amendments to the Code or reference standards. As emergency amendments, these changes should be recognized by Article 90 so the Code user can apply the TIA. This change addresses two of the major problems currently associated with TIA: 1. New technology and knowledge moving faster than the code development process; and 2. The delays that are in place at local jurisdictions when adopting newer editions of the Code that typically address the issues addressed by TIAs. In many cases, due to the code cycle and local jurisdicational processes, the adopted Code editions can be 4, 5, 6 or even 7 years plus out of date. This PI would at least ensure the emergency issued identified by the TC can be immediately incorporated into the code via the NFPA issued TIA. This PI is consistent with Section 5.11 of the Regulations Governing the Development of NFPA Standards which states: "5.11 Applicability. Tentative interim amendments shall apply to the NFPA Standard existing at the time of issuance."

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1352-NFPA 70-2023 [New Definition after Definition: Accessible (as applied to ...]	Definitions for this PI are contained in PI 1352.
Public Input No. 1352-NFPA 70-2023 [New Definition after Definition: Accessible (as applied to ...]	

Submitter Information Verification

Submitter Full Name: Anthony Apfelbeck
Organization: Altamonte Springs Building and Fire Safety Director
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 10 13:56:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Errata and Tentative Interim Amendments (TIAs) are posted on the NFPA website. These documents are available to the public at www.nfpa.org/70. Additional information on these aspects of NFPA's standards development process are available at www.nfpa.org/process.

Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]

90.7 Examination of Equipment for Safety.

For specific items of equipment and materials referred to in this *Code*, examinations for safety made under standard conditions provide a basis for approval where the record is made generally available through promulgation by organizations properly equipped and qualified for experimental testing, inspections of the run of goods at factories, and service-value determination through field inspections. This avoids the necessity for repetition of examinations by different examiners, frequently with inadequate facilities for such work, and the confusion that would result from conflicting reports on the suitability of devices and materials examined for a given purpose. Examination of equipment shall be in accordance with either (A) or (B) below:

(A) Listed Equipment. It is the intent of this *Code* that factory-installed internal wiring or the construction of equipment need not be inspected at the time of installation of the equipment, except to detect alterations or damage, if the equipment has been listed by a qualified electrical testing laboratory that is recognized as having the facilities described in the preceding paragraph and that requires suitability for installation in accordance with this *Code*. Suitability shall be determined by application of requirements that are compatible with this *Code*.

(B) Prefabricated Equipment or Installations. It is the intent of this *Code* that installed internal wiring, or the construction of prefabricated equipment or installations need not be reinspected at the time of installation of the equipment onsite, except to detect alterations or damage, if the equipment or installation has been approved as meeting one or more of approving criteria providing evidence of suitability in accordance with 110.3(X). Suitability shall also be determined by application of requirements that are compatible with this *Code*.

Informational Note No. 1: See 110.3 for guidance on safety examinations.

Informational Note No. 2: See Article 100 for definitions of *Listed* and *Reconditioned*.

Informational Note No. 3: See Informative Annex A for a list of product safety standards that are compatible with this *Code*.

Informational Note No. 4: Prefabricated equipment or installations can be performed either onsite, at remote facilities, or locations.

Informational Note No. 5: See Article 100 for the definition of *Prefabrication*.

Informational Note No. 6: See *National Electrical Installation Standard* NECA 5, *Recommended Practice for Prefabrication of Electrical Installations for Construction*, and other ANSI-approved standards for information on accepted industry prefabrication practices.

Additional Proposed Changes

File Name	Description	Approved
NECA_05-2022.pdf	NECA 5, Recommended Practice for Prefabrication of Electrical Installations in Construction.	

Statement of Problem and Substantiation for Public Input

Prefabrication is becoming very common in construction and is a means of producing electrical installations and equipment in controlled environment to result in consistent quality and safe electrical installations. Challenges of obtaining approvals have been identified, thus creating a need to include prefabrication processes in the NEC. This expansion of 90.7 in the NEC addresses examination for safety and suitability criteria for approvals of prefabrications electrical equipment and installations. Adding the informational note will provide the code user or enforcer with additional information noting that there are ANSI accredited standards on electrical prefabrication.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]	
Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]	
Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]	
Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]	
Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]	
Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 14:54:07 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The concerns of the submitter are addressed in 110.3(A). Accordingly, the addition of 90.7(B) Prefabricated Equipment or Installations is unnecessary and does not add clarity. Informational Note No. 6 does not support or improve the usability of the associated requirement. The statement “challenges of obtaining approvals have been identified” has not been substantiated.

Public Input No. 3174-NFPA 70-2023 [Section No. 90.7]

90.7 Examination of Equipment for Safety.

For specific items of equipment and materials referred to in this *Code*, examinations for safety made under standard conditions provide a basis for approval where the record is made generally available through promulgation by organizations properly equipped and qualified for experimental testing, inspections of the run of goods at factories, and service-value determination through field inspections. ~~This avoids the necessity for repetition of examinations by different examiners, frequently with inadequate facilities for such work, and the confusion that would result from conflicting reports on the suitability of devices and materials examined for a given purpose.~~

It is the intent of this *Code* that factory-installed internal wiring or the construction of equipment need not be inspected at the time of installation of the equipment, except to detect alterations or damage, if the equipment has been listed by a qualified electrical testing laboratory ~~that is recognized as having the facilities described in the preceding paragraph and that requires suitability for installation in accordance with this *Code*. Suitability shall be determined by application of requirements that are compatible with this *Code*~~ in accordance with 110.3(C) .

Informational Note No. 1: See 110.3 for guidance on safety examinations.

Informational Note No. 2: See Article 100 for definitions of *Listed* and *Reconditioned*.

Informational Note No. 3: See Informative Annex A for a list of product safety standards that are compatible with this *Code*.

Statement of Problem and Substantiation for Public Input

Prior to the inclusion of 110.3(C) in the 2017 NEC, there was not a mandatory requirement covering who performs product certification and how the product certification is to align with the NEC. This recommended revision connects 90.7 with 110.3(C). By doing so, some of the language currently in 90.7 is no longer necessary and can be deleted.

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: David Hittinger
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 20:59:31 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8874-NFPA 70-2024
Statement: Prior to the inclusion of 110.3(C) in the 2017 NEC, there was not a mandatory requirement covering who performs product certification and how the product certification is to align with the NEC. This recommended revision connects 90.7 with 110.3(C). By doing so, some of the language currently in 90.7 is no longer necessary and can be deleted.

Public Input No. 683-NFPA 70-2023 [Section No. 90.9(B)]

~~**(B)** Dual System of Units.~~

~~SI units shall appear first, and inch-pound units shall immediately follow in parentheses. Conversion from inch-pound units to SI units shall be based on hard conversion except as provided in 90.9(C) .~~

~~*Exception: The tables located in Informative Annex C shall be permitted to list the trade sizes before SI units.*~~

Statement of Problem and Substantiation for Public Input

This language is mandatory language for the CMP to follow, not the Code user to follow. Due to this, it belongs in the Style Manual. It is already in the Style Manual, so there is no reason for it to be here as well. We don't have other rules in Article 90 that tell the CMP how to write Code. Look at 90.5, for example. It tells the Code user what "shall" and "shall not" mean, it does not tell the CMP when to use those words. Section 90.9(B) is not needed in the NEC, it is only needed in the Style Manual.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 20 14:25:11 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The deletion of 90.9(B) could create contextual confusion when applying 90.9(C)(1) through 90.9(C)(4). Repeating a rule from the NEC Style Manual in the Code is not prohibited.

Public Input No. 3901-NFPA 70-2023 [New Article after 100]

Protective Conductor Current

The electric current appearing in a protective conductor, such as leakage current or electric current resulting from an insulation fault.

Informational Note: Protective conductor current is the current that will be found in the protective grounding conductor.

Touch Current

The electric current through a human body or through an animal body when it touches one or more accessible parts of an installation or of equipment.

Statement of Problem and Substantiation for Public Input

[SOURCE: IEC 60050-195, 195-05-21] These definitions appear in 3.208DV of the 4th Edition of UL 60335-2-40. The NEC standard does not adequately address the definition of touch and ground currents. These definitions would be beneficial to addressing the appropriate levels of safety required by the code.

Note: This public input is related to AHRI's 4 other public inputs in Section 210.8 (Public Input 4026), Section 440.4 (Public Input 4029), Section 440.9 (Public Input 4030), and Table A.1(a) (Public Input 4031), which provide important context. The public input in Section 210.8(F) provides exceptions where GFCI protection is not required. The public input in Section 440.4 provides marking requirements for listed HVAC equipment when the listed alternate protective grounding options are utilized by an HVAC manufacturer on equipment. The public input in section 440.9 adds listed alternate protective grounding options that can be utilized by an HVAC manufacturer on equipment in lieu of adding GFCI protection in the field. The public input in Table A.1 (a) adds UL 60335-2-40 as a referenced standard because Section 210.8(F) references "listed HVAC equipment" and this is the applicable reference for listed HVAC equipment.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4026-NFPA 70-2023 [Section No. 210.8(F)]	
Public Input No. 4029-NFPA 70-2023 [Section No. 440.4(C)]	
Public Input No. 4030-NFPA 70-2023 [Section No. 440.9]	
Public Input No. 4031-NFPA 70-2023 [Definition:]	
Public Input No. 4026-NFPA 70-2023 [Section No. 210.8(F)]	
Public Input No. 4029-NFPA 70-2023 [Section No. 440.4(C)]	
Public Input No. 4030-NFPA 70-2023 [Section No. 440.9]	
Public Input No. 4031-NFPA 70-2023 [Definition:]	

Submitter Information Verification

Submitter Full Name: Thomas Deary
Organization: AHRI
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 09:32:35 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The terms are not currently used in the NEC and therefore, the definitions are not necessary at this time.

Public Input No. 1492-NFPA 70-2023 [Definition:]

Scope. This article contains only those definitions essential to the application of this *Code*. It is not intended to include commonly defined general terms or commonly defined technical terms from related codes and standards. An article number in parentheses following the definition indicates that the definition only applies to that article. Where this *Code* provides a definition for a term or phrase, the Code provided definition shall prevail over other than *Code* dictionary definitions for the same term or phrase.

Informational Note: A definition that is followed by a reference in brackets has been extracted from one of the following standards. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

(1) NFPA 30A-2021, *Code for Motor Fuel Dispensing Facilities and Repair Garages*

(2) NFPA 33-2021, *Standard for Spray Application Using Flammable or Combustible Materials*

(3) NFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*

(4) NFPA 79-2021, *Electrical Standard for Industrial Machinery*

(5) NFPA 99-2021, *Health Care Facilities Code*

(6) NFPA *101*® -2022, *Life Safety Code*®

(7) NFPA 110-2019, *Standard for Emergency and Standby Power Systems*

(8) NFPA 303-2021, *Fire Protection Standard for Marinas and Boatyards*

(9) NFPA 307-2021, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*

(10) NFPA 499-2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*

(11) NFPA 501-2022, *Standard on Manufactured Housing*

(12) NFPA 790-2021, *Standard for Competency of Third-Party Field Evaluation Bodies*

(13) NFPA 1192-2021, *Standard on Recreational Vehicles*

Statement of Problem and Substantiation for Public Input

NEC definitions must be used where the NEC provides them. This is something I have been told, practiced, and repeated. The same can be said about a lot of electricians, inspectors, and code users (no numbers data offered to CMP on this statement). This can't be mandatory though unless the NEC writes it as mandatory.

There are consequences for using NEC provided terms outside of their NEC definition. Take 'service' for example. A disconnect beside an outdoor AC unit may 'serve or service' that AC unit but the disconnect is not a 'service disconnect' according to the NEC version of 'service'. That disconnect may be suitable for use as service equipment but unless the disconnect is used as an NEC recognized service disconnect, the SERVICE sticker that came with the disconnect should not be applied. In that same vein, every service recognized as an NEC service shall have the handle(s) labeled SERVICE DISCONNECT (230.70B).

'Prevail over' isn't the same things as saying 'exclusively' so this new pubic input isn't too restrictive. Terms and their root words such as serve (517.13), served, and serving may still be used as NEC language outside their NEC definitions. NEC defined words used outside their Article 100 meaning should be avoided throughout the NEC to avoid confusion.

Submitter Information Verification

Submitter Full Name: Norman Feck
Organization: State of Colorado
Affiliation: self
Street Address:
City:
State:
Zip:

Submittal Date: Fri Jul 21 17:00:09 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Per 4.3.4.1 (c), the recommendation shall include the proposed text of the Public Input, including the wording to be added, revised (and how revised), or deleted.

Public Input No. 4507-NFPA 70-2023 [Definition:]

Scope. This article contains only those definitions essential to the application of this *Code*. It is not intended to include commonly defined general terms or commonly defined technical terms from related codes and standards. An article number in parentheses following the definition indicates that the definition only applies to that article. Modifications to a definition indicated as "NFPA Official Definition" shall be submitted to the NFPA Standards Council. The content of definitions not indicated as "NFPA Official Definition" falls within the purview of the assigned Code-Making Panel indicated parenthetically following each definition and of the Correlating Committee.

Informational Note: A definition that is followed by a reference in brackets has been extracted from one of the following standards. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

(1) NFPA 30A-2021, *Code for Motor Fuel Dispensing Facilities and Repair Garages*

(2) NFPA 33-2021, *Standard for Spray Application Using Flammable or Combustible Materials*

(3) NFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*

(4) NFPA 79-2021, *Electrical Standard for Industrial Machinery*

(5) NFPA 99-2021, *Health Care Facilities Code*

(6) NFPA *101*®-2022, *Life Safety Code*®

(7) NFPA 110-2019, *Standard for Emergency and Standby Power Systems*

(8) NFPA 303-2021, *Fire Protection Standard for Marinas and Boatyards*

(9) NFPA 307-2021, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*

(10) NFPA 499-2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*

(11) NFPA 501-2022, *Standard on Manufactured Housing*

(12) NFPA 790-2021, *Standard for Competency of Third-Party Field Evaluation Bodies*

(13) NFPA 1192-2021, *Standard on Recreational Vehicles*

Statement of Problem and Substantiation for Public Input

NEC® CORRELATING COMMITTEE TAKE NOTE. 2023 NEC® Style Manual 2.1.2.6.3 is in conflict with the "Regulations Governing NFPA Standards Development" 3.3.6.1. 2023 NEC® Style Manual 2.1.2.6.3 indicates that »For the National Electrical Code, the code-making panel responsible for the definition shall be identified in parentheses at the end of the definition following any extract or article information« and incorrectly assigns NFPA Official Definitions within NEC® to "(CMP-1)". Neither CMP-1 nor the Correlating Committee have the authority to modify NFPA Official Definitions; that authority and responsibility reside solely within the NFPA Standards Council in accordance with 3.3.6.1: »Where the following terms, commonly found in the NFPA technical committee standards, are used or defined in the body of the text, they shall be consistent with the intent of these meanings. “Definitions” shall not be altered unless approved by the Standards Council. Such altered definition shall be clear and unambiguous in the context in which it is used.«. The "Manual of Style for NFPA Technical Committee Documents" governing all NFPA publications (other than NFPA 70 and NFAP 70E) in its section 2.3.2.8 explicitly acknowledges NFPA Standards Council sole authority and responsibility for NFPA Official Definitions.

NOTA BENE: The only revised text is the addition of »Modifications to a definition indicated as "NFPA Official Definition" shall be submitted to the NFPA Standards Council. The content of definitions not indicated as "NFPA Official Definition" falls within the purview of the assigned Code-Making Panel indicated parenthetically following each definition and of the Correlating Committee.« All other revisions indicated are the spurious creation of brain-dead TerraView.

Submitter Information Verification

Submitter Full Name: Brian Rock
Organization: Hubbell Incorporated
Street Address:

City:
State:
Zip:
Submittal Date: Thu Sep 07 16:42:01 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed text is not appropriate for the NEC. As the submitter has correctly pointed out, 3.3.6.1 of the Regulations Governing the Development of NFPA Standards already provides that defined terms commonly found in the NFPA technical committee standards cannot be altered unless approved by the Standards Council.

Public Input No. 1232-NFPA 70-2023 [Definition: Accessible (as applied to wiring methods).]

Accessible (as applied to wiring methods).

Capable of being removed or exposed without damaging the building structure or finish, other electrical equipment, or other building systems; and not permanently closed in or blocked by the structure, other electrical equipment, other building systems, or finish of the building. (CMP-1)

Statement of Problem and Substantiation for Public Input

With "and," the definition says none of these things is okay.
Anybody with an ounce of sense knows that's what is intended, but technically, grammatically, that's not what using "or" means.
Let's clean it up.

Installations that require damage to other equipment for access are equally unacceptable as those that whose access require damage to structure.

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 29 09:24:44 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The application of the definition is correct as written.

Public Input No. 1233-NFPA 70-2023 [Definition: Accessible, Readily (Readily Accessible).]

Accessible, Readily (Readily Accessible).

Capable of being reached quickly for operation, renewal, or ~~inspections~~ inspection without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders~~, and so forth~~ . (CMP-1)

Informational Note: Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the *NEC*.

Statement of Problem and Substantiation for Public Input

Added "and so forth" on top of "such as" gives no additional information. I don't see an advantage to making "inspections" plural, as the general term "inspection" conveys the same requirement.

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 29 09:32:07 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8953-NFPA 70-2024
Statement: The term “inspections” was editorially changed to “inspection.”

Public Input No. 1398-NFPA 70-2023 [Definition: Accessible, Readily (Readily Accessible).]

Accessible, Readily (Readily Accessible).

Capable of being ~~reached quickly for~~ reached for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders~~, and so forth~~ . (CMP-1)

Informational Note: Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the *NEC*.

Statement of Problem and Substantiation for Public Input

The term “readily accessible” is referenced approximately 150 times in the 2023 NEC. Many references cite a location (within sight, outdoor, nearest to entrance, etc.) with the requirement to be “readily accessible,” and many do not. For many of the references that do not cite a location but do have the need to be “readily accessible,” the term “reached quickly” in the “readily accessible definition cannot be enforced. The word “quickly” should be removed from the “readily accessible” definition so that a reference point location does not have to be established to start the timing of “reached quickly.” This change will be compatible with the 2023 NEC references that cite a location and, more importantly, those that do not.

The phrase "and so forth” is a vague term. The National Electrical Code style manual does not list “and so forth” as a vague term. However, 3.2.1 states the following:
3.2.1 Unenforceable Terms. The NEC shall not contain references or requirements that are unenforceable or vague.
The term “and so forth” should be removed.

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: Duke W. Schamel
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 13 11:32:31 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: “Reached quickly” was retained to convey the sense of ready access.

Public Input No. 2134-NFPA 70-2023 [Definition: Accessible, Readily (Readily Accessible).]

Accessible, Readily (Readily Accessible).

Capable of being reached quickly for operation, renewal, or inspections ~~without requiring those to whom ready access is requisite to~~ by those who require ready access. In this case, quickly means without having to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth. (CMP-1)

Informational Note: Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the *NEC*.

Statement of Problem and Substantiation for Public Input

The current text is somewhat difficult to read. The common perception of "readily accessible" is that it pertains to anyone, not just the person to whom ready access is required. If the definition clearly states that readily accessible is for the person who needs it, than other exceptions in the Code could be deleted. For example, for roof-top units, or equipment that is accessed by a ladder. The current phrase "...those to whom ready access is requisite" may be accurate, but it is often glossed over by those reading it.

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sat Aug 12 22:20:03 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current text is adequate. The proposed revisions do not add clarity nor has substantiation been provided that the current text is being misunderstood.

Public Input No. 760-NFPA 70-2023 [Definition: Accessible, Readily (Readily Accessible).]

Accessible, Readily (Readily Accessible).

Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys or identification tags), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth. (CMP-1)

Informational Note: Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the *NEC*.

Statement of Problem and Substantiation for Public Input

Electronic tags such as magnetic cards, RFID cards, RFID fobs, and optical scan codes are also used, but they are not keys and should also not be considered a tool for the purposes of ready accessibility.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 02 01:25:47 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed text was not accepted as electronic tags such as RFID fobs or cards are considered to be electronic keys to gain access.

Public Input No. 1085-NFPA 70-2023 [Definition: Approved.]

Approved.

~~Acceptable to~~ Accepted by the authority having jurisdiction. (CMP-1)

Statement of Problem and Substantiation for Public Input

More positive language clarifies the active role an AHJ has in approving products and installations.

This slight rewording makes it clear that “approved” is not a matter of prediction or speculation, perhaps based on “The inspector in my other jurisdiction didn’t have a problem with this.” If an installer doesn’t know whether an AHJ accepts X, in a reasonable jurisdiction they can call and ask. When a phone call wouldn't do it, I've had inspectors (Montgomery County, MD) drive out to look--before it was time for the pass-fail inspection.

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 16:29:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current wording is well understood in the industry. The AHJ definition adequately describes the role.

Public Input No. 4386-NFPA 70-2023 [Definition: Automatic.]

Automatic.

Performing a function without the necessity of human intervention. (CMP-1)

Availability. The percentage of time that a system is available to perform its function(s)

Statement of Problem and Substantiation for Public Input

The availability of a power system is its essential characteristic which supports practical electrical safety for the individual and the public. Everything we do in the power industry is focused on making sure that power is available because of the linkage between public safety and safe and available electrical power. Loss of electrical power happens with far greater frequency than electrical wiring fires.

This definition, coupled with the tern "reliable" should track explicitly in the NEC and should raise awareness that reliability calculations are as essential as short circuit and load flow calculations. We see an expansion of this concept in Annex F and in related proposals for this NEC revision cycle..

Submitter Information Verification

Submitter Full Name:	Michael Anthony
Organization:	Standards Michigan LLC
Affiliation:	Robert G. Arno | Northpointe Defense | Neal Dowling, MTechnologies | Michael A Anthony, StandardsMichigan.COM
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu Sep 07 13:43:12 EDT 2023
Committee:	NEC-P01

Committee Statement

Resolution: The proposed definition is not necessary. The NEC does not have a requirement that is concerned with a percentage of time.

Public Input No. 1082-NFPA 70-2023 [Definition: Device.]

Device.

A unit of an electrical system, other than a conductor ~~, that carries or controls electric energy as its principal function.~~ or component, whose principal function is to carry or control electric energy without conversion. I.P. See **Utilization Equipment** (CMP-1)

Statement of Problem and Substantiation for Public Input

The term, "utilization device" is in common use. The I.P. will help people who expect this to be covered under Device, by pointing them forward to "utilization equipment."

I suspect that the intent does not include classifying transformers as devices, or at least not all of them, even though they carry electricity and convert it to serve utilization equipment rather than utilizing it themselves. At the same time, I find it hard to believe that a USB charger mounted in a switch box is not considered a device. Should we class it as utilization equipment? Shall we differentiate between luminaires and, for example, gem lights, or treat both as utilization equipment?

The proposed language, "without conversion," offers an extreme option--making that USB charger a non-Device unless it's part of a receptacle or, perhaps, a cover plate. The proposed addition of the term "component" offers the choice to consider pieces such as pull chains that can be added to luminaires as Devices, even though their sole purpose is to control electricity. It also would exclude splicing devices, and not only isolators added on the load side of ballasts.

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 14:33:09 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: A component, can be a device and therefore is already included in the term. Additional information is requested from the submitter to further define the term “IP.”

Public Input No. 1744-NFPA 70-2023 [Definition: Device.]

Device.

A unit of an electrical system, other than a conductor, that carries or controls electric energy as its principal function. (CMP-1)

Add new Informational Note:

Informational Note: A device is considered to be an outlet (see definition of outlet).

Statement of Problem and Substantiation for Public Input

There have been many on social media sites that have maintained a device has an outlet, I do not agree, I have always believed this is nothing more than a disconnecting means, clarification and substantiation on the intent of this definition from Code Making Panel 1 would be helpful.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1742-NFPA 70-2023 [Definition: Disconnecting Means.]	
Public Input No. 452-NFPA 70-2023 [Definition: Outlet.]	
Public Input No. 1746-NFPA 70-2023 [Definition: Receptacle.]	
Public Input No. 1745-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 452-NFPA 70-2023 [Definition: Outlet.]	
Public Input No. 1742-NFPA 70-2023 [Definition: Disconnecting Means.]	
Public Input No. 1745-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 1746-NFPA 70-2023 [Definition: Receptacle.]	

Submitter Information Verification

Submitter Full Name: James Stallcup
Organization: Volt Online Academy
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 31 15:23:46 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: A device can be part of the “outlet” but is not always an “outlet.” Per 2.1.10.1 of the NEC Style manual, this informational note contains explanatory information to support or improve usability of the associated definition.

Public Input No. 1742-NFPA 70-2023 [Definition: Disconnecting Means.]

Disconnecting Means.

A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply. (CMP-1)

Add new Informational Note:

Informational Note: The load side of the disconnecting means is considered to be an outlet (see definition of outlet).

Statement of Problem and Substantiation for Public Input

There have been many on social media sites that have maintained the load side of the disconnecting means has an outlet, I do not agree, I have always believed this is nothing more than a disconnecting means, clarification and substantiation on the intent of this definition from Code Making Panel 1 would be helpful.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1744-NFPA 70-2023 [Definition: Device.]	
Public Input No. 452-NFPA 70-2023 [Definition: Outlet.]	
Public Input No. 1746-NFPA 70-2023 [Definition: Receptacle.]	
Public Input No. 1745-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 452-NFPA 70-2023 [Definition: Outlet.]	
Public Input No. 1744-NFPA 70-2023 [Definition: Device.]	
Public Input No. 1745-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 1746-NFPA 70-2023 [Definition: Receptacle.]	

Submitter Information Verification

Submitter Full Name: James Stallcup
Organization: Volt Online Academy
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 31 15:03:25 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The load side of a disconnecting means is not always the “outlet.” Per 2.1.10.1 of the NEC Style manual, this informational note contains explanatory information to support or improve usability of the associated definition.

Public Input No. 793-NFPA 70-2023 [Definition: Enclosure.]

Enclosure.

The case or housing of ~~apparatus, or~~ apparatus or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage. (CMP-1)

Informational Note: See Table 110.28 for examples of enclosure types.

Statement of Problem and Substantiation for Public Input

This recommendation is to remove the comma to clarify that the phrase " to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage" applies to both the "case or housing of apparatus" and "the fence or walls surrounding an installation."

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 10 12:02:25 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8968-NFPA 70-2024
Statement: The comma after “apparatus” was removed to clarify that the phrase "to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage" applies to both the case or housing of

apparatus and the fence or walls surrounding an installation.

Public Input No. 1989-NFPA 70-2023 [Definition: Fitting.]

Fitting.

An accessory such as a locknut, bushing, coupling or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function. (CMP-1)

Statement of Problem and Substantiation for Public Input

changing tubing termination back to the fitting term to describe better what a tubing termination is

Submitter Information Verification

Submitter Full Name: Wyatt Peyton
Organization: OESCO
Affiliation: IBEW 1141
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 10 08:52:20 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: It is not necessary to add one more example to “such as.”

Public Input No. 900-NFPA 70-2023 [Definition: Fitting.]

Fitting.

An accessory, not including support hardware, such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function. (CMP-1)

Statement of Problem and Substantiation for Public Input

The 3xx.6 sections of the wiring method articles require fittings to be listed. This becomes problematic when discussing support hardware, because the current definition seems to include support hardware despite UL 514B not pertaining to them.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 17:24:01 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: What is meant by “support hardware” is unclear.

Public Input No. 684-NFPA 70-2023 [Definition: Identified (as applied to equipment).]

Identified (as applied to equipment).

~~Recognizable as suitable~~ Designed and manufactured for the specific purpose, function, use, environment, application, and so forth, where described in a particular *Code* requirement. (CMP-1)

Informational Note: Some examples of ways to determine suitability of equipment for a specific purpose, environment, or application include investigations by a qualified testing laboratory (listing and labeling), an inspection agency, or other organizations concerned with product evaluation.

Statement of Problem and Substantiation for Public Input

The current definition does not indicate who the party is that determines that a product is "recognizable as suitable." If it is the AHJ, then this is no different than "approved." If it is a certifying body, it is not much different than "listed." If it is the end user, then the rule has no teeth.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 20 14:28:31 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: “Recognizable as suitable” is clear as is. The recommended text does not increase usability or clarity.

Public Input No. 1191-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]

~~**In Sight From (Within Sight From) (Within Sight).**~~

~~Equipment that is visible and not more than 15 m (50 ft) distant from other equipment is~~ ~~*in sight from*~~ ~~that other equipment. (CMP-1)~~

~~Informational Note:~~ ~~See~~ ~~110.29~~ ~~for additional information.~~

Statement of Problem and Substantiation for Public Input

Delete this definition as it is both unnecessary as it is a general requirement in Article 110 - See 110.29 - and it is a violation of the NEC Style Manual - See 2.1.2.5 Style. where it states, in part, that "[d]efinitions shall not contain requirements..." In addition to being redundant and unnecessary as a definition since there is a general requirement in 110.29 that applies elsewhere in NEC per 90.3, the definition contains a requirements since it states exactly what the required parameters (requirements) are for the definition to be met. Namely, "Equipment that is visible and not more than 15 m (50 ft) distant from other equipment..." Further, CMP-1 specifically created the requirement in 110.29 to replace this definition for the 2023 NEC.

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 22 15:09:34 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8975-NFPA 70-2024
Statement: The definition and its associated informational note were deleted as they are no longer necessary. The requirement is provided in 110.29.

Public Input No. 1216-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]

~~**In Sight From (Within Sight From) (Within Sight).**~~

~~Equipment that is visible and not more than 15 m (50 ft) distant from other equipment is~~ ~~*in sight from*~~ ~~that other equipment. (CMP-1)~~

~~Informational Note:~~ ~~See~~ ~~110.29~~ ~~for additional information.~~

Statement of Problem and Substantiation for Public Input

The definition contains a requirement (visible and within a specified distant). In addition, the definition includes the defined term. Both are prohibited by 2.2.2.5 of the 2023 NEC Style Manual.
This definition has been in the NEC for a very long time, yet has been wrong all along. NEC 2023 added a new Code requirement (100.29) that covers every instance of "in sight" in the entire NEC. To avoid confusion, the definition was retained in Article 100, with an Informational Note directing readers to 110.29. Code users now have had three years to become accustomed to the new (correct) location in Article 110. It is time to remove the definition.

Submitter Information Verification

Submitter Full Name: William Fiske
Organization: Intertek Testing Services
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 27 13:26:14 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8975-NFPA 70-2024
Statement: The definition and its associated informational note were deleted as they are no longer necessary. The requirement is provided in 110.29.

Public Input No. 2005-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]

In Sight From (Within Sight From) (Within Sight).

Equipment that is visible and not more than 15 m (50 ft) distant from ~~other equipment is~~ *~~in sight from~~* ~~that~~ a building or structure, or from other equipment. (CMP-1)

Informational Note: See 110.29 for additional information.

Statement of Problem and Substantiation for Public Input

The addition of building or structure is needed as the term "within sight" is used in the Code for equipment that needs to be within sight of a building or structure. See 550.32(A) and 702.12(A) for example.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2006-NFPA 70-2023 [Section No. 110.29]	

Submitter Information Verification

Submitter Full Name: Peter Diamond
Organization: Diamond Seminars
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 11 04:45:32 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The definition and its associated informational note were deleted as they are no longer necessary. The requirement is provided in 110.29

Public Input No. 2383-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]

In Sight From (Within Sight From) (Within Sight).

Equipment that is visible and not more than 15 m (50 ft) distant from other equipment, building, or structure is *in sight from* that other equipment, building, or sturcture . (CMP-1)

Informational Note: See 110.29 for additional information.

Statement of Problem and Substantiation for Public Input

In 230.85 and 225.41 the emergency disconnecting means is required to be within sight of the dwelling unit. The definition is used in the context of having equipment being within sight of building or structures not only from other equipment. Revising the definition will help Code users understand how to apply the requirements better.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 15:41:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The definition and its associated informational note were deleted as they are no longer necessary. The requirement is provided in 110.29

Public Input No. 586-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]

In Sight From (Within Sight From) (Within Sight).

Equipment that is visible from that other equipment cited and not more than 15 m (50 ft) distant from ~~other equipment is~~ ~~*in sight from*~~ ~~that other equipment~~ that same equipment cited . (CMP-1)

Informational Note: See 110.29 for additional information.

Statement of Problem and Substantiation for Public Input

Present wording violates NEC® Style Manual 2.2.2.2: "... Definitions ... shall not contain the term that is being defined. ..." The present definition includes the defined term "in sight from". The only significant portion, the datum "from that other equipment", in this last sentence clause can be relocated by concatenating to "is visible" in the first sentence clause.

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Further, the present definition omits an essential COORDINATING CONJUNCTION "and" that should be located between "... distant from other equipment" and "is in sight from that other equipment." As such, this nongrammatical structure violates NEC® Style Manual 1.2.1, Manual of Style for NFPA Technical Committee Documents 3.2.1.1, and The Chicago Manual of Style 5.194. As indicated above, that final sentence clause is unnecessary because it is predicated upon using the the very term it is intended to define.

.

The second sentence clause " ... not more than 15 m (50 ft) distant from OTHER equipment ..." lacks specificity. Is this a distance from ANY OTHER equipment, related or not? No! This sentence clause must be more specific to reference "THAT OTHER equipment CITED" that is being used as a datum.

Submitter Information Verification

Submitter Full Name: Brian Rock
Organization: Hubbell Incorporated
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 11 14:02:05 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The definition and its associated informational note were deleted as they are no longer necessary. The requirement is provided in 110.29

Public Input No. 746-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]

~~**In Sight From (Within Sight From) (Within Sight).**~~

~~Equipment that is visible and not more than 15 m (50 ft) distant from other equipment is~~ ~~*in sight from*~~ ~~that other equipment. (CMP-1)~~

~~Informational Note:~~ ~~See~~ ~~110.29~~ ~~for additional information.~~

Statement of Problem and Substantiation for Public Input

Delete this definition as it does not comply with 2.2.2.2 of the 2020 NEC Style Manual. I recognize this section may be different in a subsequent edition of the NEC Style Manual. Regardless, the definition contains a requirement and therefore violates the NEC Style Manual. The 2020 edition was the edition of the NEC Style Manual in effect at the time this Public Input was submitted. In addition, 110.29 was created as a requirement in the 2023 edition of the NEC to replace this non-compliant definition.

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 26 17:24:56 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8975-NFPA 70-2024
Statement: The definition and its associated informational note were deleted as they are no longer necessary. The requirement is provided in 110.29.

Public Input No. 3399-NFPA 70-2023 [Definition: Labeled.]

Labeled.

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner. (CMP-1)

Alternatively, an authority having jurisdiction can verify the label, symbol or other identifying mark of listed equipment or materials using an internet web address, quick response (QR) code or other electronic means marked on the equipment or materials linked to a manufacturer's website.

Informational Note: If a listed product is of such a size, shape, material, or surface texture that it is not possible to apply legibly the complete label to the product, the complete label ~~may~~ , web address, quick response (QR) code or other electronic means may appear on the smallest unit container in which the product is packaged.

Statement of Problem and Substantiation for Public Input

The utilization of electronic labeling addresses physical space availability challenges brought about by increasing numbers of worldwide certification and conformity assessment marks that are required on labels. Further, electronic labeling enables response to increasingly rapid changes of technical data that determines equipment suitability and selection, avoiding the case where printed labels become out of date in fairly short order. Additional practical considerations related to enhancing instruction sheet accuracy and the facilitation of more flexible and cost-competitive packaging, along with emerging safeguards against equipment counterfeiting are other strong reasons for NEMA's position to support electronic labeling initiatives as they move forward throughout and in conjunction with industry stakeholders.

Manufacturers are best placed to provide and maintain this information given their knowledge of the equipment, the fact they already provide much of this regulatory information and other materials to consumers as a normal part of their business, and the fact they can manage this as simply another part of their broader regulatory compliance and system administration activities.

The manufacturer or system provider are more incentivized to ensure that its compliance information is current, accurate, and remains in real time/up to date. Ease of regulators being able to access this information can head off or help to minimize customs- related shipment and delivery delays, or associated penalties with questionable or lack of certification compliance.

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat Sep 02 13:35:51 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The concerns of the submitter are already addressed in 110.3(B). Further, the proposed definition contains a requirement which is in violation of 2.1.2.5 of the NEC Style Manual. The label is intended to remain attached for the life of the equipment. It has not been substantiated that the QR code labels have equivalent service life.

Public Input No. 3293-NFPA 70-2023 [Definition: Listed.]

Listed.

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose. (CMP-1)

Informational Note 1 : The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system employed by the listing organization allows the authority having jurisdiction to identify a listed product.

Informational Note 2: Listed may be further qualified by listing for a location (e.g. Classified, wet, or dry) or listed for an application (e.g. grounding, bonding, or terminating)

Statement of Problem and Substantiation for Public Input

"listed for location" and "listed for application" is used in different locations throughout the NEC. These can be taken to mean the same thing, but generally this is not 100% true. Since both are used throughout the NEC, adding a definition to Article 100 to define what the term(s) mean would prove helpful to understanding the NEC clauses that use the term(s).

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 16:41:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The information provided in the proposed informational note is already included in the definition.

Public Input No. 1071-NFPA 70-2023 [Definition: Location, Wet. (Wet Location)]

Location, Wet. (Wet Location)

A location that is one or more of the following:

(1) Unprotected and exposed to weather

(2) Subject to saturation with water ~~and~~ or other liquids

(3) Underground

(4) In concrete slabs or masonry in direct contact with the earth

(CMP-1)

Informational Note: A vehicle washing area is an example of a wet location saturated with water or other liquids.

Statement of Problem and Substantiation for Public Input

The revision makes it clear that a wet location can be one with only water or only other liquids or a combination of both. To require another liquid with water does not make sense. The informational note following this definition makes it clear.

Submitter Information Verification

Submitter Full Name: Christine Porter
Organization: Intertek Testing Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 10:43:57 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8978-NFPA 70-2024
Statement: The revision makes it clear that a wet location can be one with only water or only other liquids or a combination of both.

Public Input No. 1141-NFPA 70-2023 [Definition: Location, Wet. (Wet Location)]

Location, Wet. (Wet Location)

A location that is one or more of the following:

(1) Unprotected and exposed to weather

(2) Subject to saturation with water ~~and other~~ or other liquids

(3) Underground

(4) In concrete slabs or masonry in direct contact with the earth

(CMP-1)

Informational Note: A vehicle washing area is an example of a wet location saturated with water or other liquids.

Statement of Problem and Substantiation for Public Input

This proposed revision comes from discussions NFPA 79 TC had while attempting to update their document. Clearly, a location with water or other liquids is what was intended, here, and not that the location have both "water and other liquids" present in order to be considered a wet location. The proposed revision here will allow NFPA 79 and other documents which use this definition to extract the material without needing to attempt an update in their document, in violation of the extract policy. NFPA 79's 2nd revision to fix this was overturned by the Correlating Committee as it violated the extract policy and it was suggested in the meeting that the revision needs to occur in NFPA 70 before it can be corrected in the other documents.

Submitter Information Verification

Submitter Full Name: Richard Holub
Organization: The DuPont Company, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 20 07:29:15 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8978-NFPA 70-2024
Statement: The revision makes it clear that a wet location can be one with only water or only other liquids or a combination of both.

Public Input No. 1217-NFPA 70-2023 [Definition: Location, Wet. (Wet Location)]

Location, Wet. (Wet Location)

A location that is one or more of the following:

(1) Unprotected and exposed to weather

(2) Subject to saturation with water ~~and other~~ or other liquids

(3) Underground

(4) In concrete slabs or masonry in direct contact with the earth

(CMP-1)

Informational Note: A vehicle washing area is an example of a wet location saturated with water or other liquids.

Statement of Problem and Substantiation for Public Input

As written in NEC 2023, unless a particular location were subjected to both water and one or more other liquids, it would not be a wet location, Exposure to water would be a necessary condition but not a sufficient one. The intent is clearly that water OR other liquid(s) is necessary and sufficient for the existence of a wet location. The definition should so state. OR includes AND.

Submitter Information Verification

Submitter Full Name: William Fiske
Organization: Intertek Testing Services
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 27 13:39:02 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8978-NFPA 70-2024
Statement: The revision makes it clear that a wet location can be one with only water or only other liquids or a combination of both.

Public Input No. 2463-NFPA 70-2023 [Definition: Location, Wet. (Wet Location)]

Location, Wet. (Wet Location)

A location that is one or more of the following:

(1) Unprotected and exposed to weather

(2) Subject to saturation with water and other liquids

(3) Underground

(4) In concrete slabs or masonry in direct contact with the earth

(5) Interior of a raceway (s) in wet location is considered a wet location

(CMP-1)

Informational Note: A vehicle washing area is an example of a wet location saturated with water or other liquids.

Statement of Problem and Substantiation for Public Input

Section 300.9 states that the interior of raceway aboveground is considered a wet location. Adding this text to the definition of “wet location” will make it clear that the area inside a raceway located in a wet location is a wet location. This proposed revision will bring clarity Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 13:50:25 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The submitter’s concern is addressed in 300.9. Further, definitions cannot contain a requirement per 2.1.2.5. of the NEC Style Manual.

Public Input No. 174-NFPA 70-2023 [Definition: Outlet.]

Outlet.

~~A point on the wiring system at which current is taken to supply utilization equipment.~~ The point where branch circuit conductors connect to, or will be connected to utilization equipment terminals or conductors. (CMP-1)

Statement of Problem and Substantiation for Public Input

With the addition of 210.8(F) to the code, it seems that a number of code users no longer understand what an outlet is. One code instructor and author is teaching that there is no requirement to provide GFCI protection for an outside air conditioner because it is not connected to an outlet. This PI is intended to make it clear that any and all functioning equipment is supplied by an outlet.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3140-NFPA 70-2023 [Definition: Lighting Outlet.]	
Public Input No. 3141-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 3140-NFPA 70-2023 [Definition: Lighting Outlet.]	
Public Input No. 3141-NFPA 70-2023 [Definition: Receptacle Outlet.]	

Submitter Information Verification

Submitter Full Name: Don Ganiere
Organization: none
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 17 12:24:00 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed text does not add clarity or usability.

Public Input No. 452-NFPA 70-2023 [Definition: Outlet.]

Outlet.

A point on the wiring system at which current is taken to supply utilization equipment. (CMP-1)

Add Informational Note:

Informational Note: An outlet is a point on the wiring system located at the outlet box, at a circuit breaker, load side of the disconnecting means, the wiring method, inside utilization equipment, or where the wiring methods connects to utilization equipment.

Statement of Problem and Substantiation for Public Input

There have been many opinions on where the outlet is located for hard-wired utilization equipment, I personally believe there is no outlet, this is nothing more than a termination. However, clarification from Code Making Panel 1 based on the intent of the definition for an outlet, would be helpful.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1742-NFPA 70-2023 [Definition: Disconnecting Means.]	
Public Input No. 1744-NFPA 70-2023 [Definition: Device.]	
Public Input No. 1746-NFPA 70-2023 [Definition: Receptacle.]	
Public Input No. 1745-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 1742-NFPA 70-2023 [Definition: Disconnecting Means.]	
Public Input No. 1744-NFPA 70-2023 [Definition: Device.]	
Public Input No. 1745-NFPA 70-2023 [Definition: Receptacle Outlet.]	
Public Input No. 1746-NFPA 70-2023 [Definition: Receptacle.]	

Submitter Information Verification

Submitter Full Name: James Stallcup
Organization: Volt Online Academy
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 14 13:07:01 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed informational note does not support the definition. Further, an informational note cannot contain a requirement or make interpretations per 2.1.10.2 of the NEC Style Manual.

Public Input No. 904-NFPA 70-2023 [Definition: Premises Wiring (System).]

Premises Wiring (System).

Interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all their associated hardware, fittings, and wiring devices, both permanently and temporarily installed. This includes one of the following:

(1) Wiring from the service point ~~or power source~~ to the outlets

(2) Wiring from and including the power source to the outlets ~~where~~ if there is no service point

Such wiring does not include wiring internal to appliances, luminaires, motors, controllers, motor control centers, and similar equipment. (CMP-1)

Informational Note: Power sources include, but are not limited to, interconnected or stand-alone batteries, solar photovoltaic systems, other distributed generation systems, or generators.

Statement of Problem and Substantiation for Public Input

If the installation is supplied by a service the premises wiring system does not begin at the source, it begins at the service point.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 28 12:06:49 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8980-NFPA 70-2024
Statement: The word “where” was editorially changed to “if” and “power source” was removed from (1) as it is addressed in (2).

Public Input No. 3634-NFPA 70-2023 [Definition: Reconditioned.]

Reconditioned.

Electromechanical systems, equipment, apparatus, or components that are restored to operating conditions for other than the present end user . This process differs from normal servicing or repair of equipment that remains within a facility, or replacement of listed equipment on a one-to-one basis. (CMP-1)

Informational Note: The term *reconditioned* is frequently referred to as *rebuilt*, *refurbished*, or *remanufactured*.

Statement of Problem and Substantiation for Public Input

This is a companion Public Input to a proposed new definition "Repair". The Code lacks a definition for the term “repaired”, which takes into account electromechanical systems, equipment, apparatus, or components that are brought back to operating conditions for the present user, as opposed to a new or different user. The presently defined term “reconditioned” is proposed to be amended to differentiate it from repair by denoting that reconditioning takes place when the equipment changes hands, i.e., other than the present user.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3632-NFPA 70-2023 [Definition: Remote Disconnect Control.]	
Public Input No. 3632-NFPA 70-2023 [Definition: Remote Disconnect Control.]	

Submitter Information Verification

Submitter Full Name: David Kendall
Organization: Abb Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 10:51:35 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: It is unclear what the “end user” is or why it matters if the equipment changes hands.

Public Input No. 3632-NFPA 70-2023 [Definition: Remote Disconnect Control.]

Remote Disconnect Control.

An electric device and circuit that controls a disconnecting means through a relay or equivalent device. (645) (CMP-12)

Repaired. . Electromechanical systems, equipment, apparatus, or components that are restored to operating conditions for the present end user. (Proposed CMP-1)

Statement of Problem and Substantiation for Public Input

This is a companion Public Input to a proposed revision to "Recondition". The Code lacks a definition for the term “repaired”, which takes into account electromechanical systems, equipment, apparatus, or components that are brought back to operating conditions for the present user, as opposed to a new or different user. The presently defined term “reconditioned” is proposed to be amended to differentiate it from repair by denoting that reconditioning takes place when the equipment changes hands, i.e., other than the present user.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3634-NFPA 70-2023 [Definition: Reconditioned.]	
Public Input No. 3634-NFPA 70-2023 [Definition: Reconditioned.]	

Submitter Information Verification

Submitter Full Name: David Kendall
Organization: Abb Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 10:45:27 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed definition does not add clarity. It is unclear why it matters if the equipment changes hands.

Public Input No. 2513-NFPA 70-2023 [Definition: Sealable Equipment.]

~~**Sealable Equipment.**~~

~~Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. (CMP-1)~~

~~Informational Note:~~ ~~The equipment may or may not be operable without opening the enclosure.~~

Statement of Problem and Substantiation for Public Input

The word "sealable" is used only twice in the NEC (not including the definition itself). Those instances are in 240.6(C) and, as of the 2023 edition, 750.30(C). In both of those instances we are talking about equipment whose adjustments are behind a sealable cover, the most common of which is the clear plastic that covers the dials of an adjutable trip circuit breaker.
Perhaps there was once a requirement in the NEC that pertained to "sealable equipment," but it appears there no longer is. This definition should be deleted.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 18 14:00:35 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The substantiation does not support the recommendation as the term is used in the Code.

Public Input No. 3053-NFPA 70-2023 [Definition: Structure.]

Structure.

That which is built or constructed, other than the use of equipment providing support, or supporting system for equipment support . (CMP-1)

Statement of Problem and Substantiation for Public Input

Adding text for the definition of “Structure” to clarify that a supporting system for electrical equipment such as Unistrut or some wood supporting member is not a structure. The proposed revisions will bring clarity to Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:42:56 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The Panel concludes that supports can be part of the structure per the definition.

Public Input No. 537-NFPA 70-2023 [Definition: Structure.]

Structure.

That which is built or constructed, other than equipment or equipment on supports . (CMP-1)

Additional Proposed Changes

File Name	Description	Approved
structure_V_equipment2.jpg	Is this equipment on supports or a structure?	

Statement of Problem and Substantiation for Public Input

In cases where a single item or multiple items of electrical equipment is supported off the ground by a fabricated support system, some AHJs are calling that support system a structure and requiring a grounding electrode system for that structure. The change in the 2017 code that added the words "other than equipment" was intended to eliminate the requirement for a grounding electrode at the equipment. This PI is attempting to clarify that the installation in the attached image is equipment on supports and the combination of the support system and the supported equipment is not a structure.

Submitter Information Verification

Submitter Full Name: Don Ganiere
Organization: none
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 05 16:27:48 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The Panel concludes that supports can be part of the structure per the definition.

Public Input No. 1046-NFPA 70-2023 [Definition: Tower.]

Tower.

A pole or other structure that supports a wind turbine. (694) (CMP-4)

Townhouse.

A single family dwelling unit constructed in a group of three or more attached units in which each unit extends from the foundation,or slad to the roof with an approved firewall without any thru penetration from unit to unit, with a yard or public way on at least two sides.

Statement of Problem and Substantiation for Public Input

Townhouse have never been in the NEC.
Firewalls in townhouse from basement to roof line makes it a single family dwelling .
Penetration are not allowed thru the firewall to other units for plumbing and HVAC and should be added to the NEC for electrical feeding other units.
Owners of these townhouse should not have SER cable running thru there units feeding other units.

Submitter Information Verification

Submitter Full Name: John Plourde
Organization: Portsmouth Nh City Of
Affiliation: PERORMANCE ELECTRICAL TRAINING LLC.
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 12 16:20:54 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The definition does not enhance usability. Adding this definition would not prevent feeders (SER cable) from passing through a building or other structure. The proposed definition included requirements which is prohibited by 2.1.2.5 of the NEC Style Manual.

Public Input No. 520-NFPA 70-2023 [Definition: Utilization Equipment.]

Utilization Equipment.

Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes, as its principal electrical function . (CMP-1)

Statement of Problem and Substantiation for Public Input

This PI was motivated by the question "is a GFCI receptacle utilization equipment?" The current definition admits the interpretation that it is, as a GFCI receptacle utilizes some electrical energy to run its internal electronics. The proposed text would clarify that as the principal electrical function is as a receptacle, a GFCI receptacle is not utilization equipment.

The proposed clarification mirrors the language in the definition of "device." The textual change reinforces a dichotomy between devices and utilization equipment. The inclusion of the word "electrical" in the phrase "principal electrical function" is to cover, for example, the case of a gas range, whose principal function is not electrical at all; but if it uses electricity for lights, electronics, or igniting gas, then it is still utilization equipment.

The question of whether a GFCI receptacle is utilization equipment arises because of 210.8(F), which requires GFCI protection for certain outdoor outlets at dwelling units. If a GFCI receptacle is itself utilization equipment, that means an outlet exists upstream of the GFCI receptacle, which outlet would not be protected by the GFCI receptacle. Therefore a GFCI receptacle at the outdoor outlet could not be used to satisfy 210.8(F); an upstream GFCI breaker or indoor GFCI would be required.

As I understand that this is not the intended import of 210.8(F), it seems simplest to clarify the definition of utilization equipment. This clarification would also exclude other electronic equipment that is part of the wiring system from being considered utilization equipment, such as: lighted snap switches; GFCI or AFCI circuit breakers; PV inverters; etc.

Submitter Information Verification

Submitter Full Name: Wayne Whitney
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 28 16:01:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: No substantiation was submitted that this has been a source of misunderstanding.

Public Input No. 1352-NFPA 70-2023 [New Definition after Definition: Accessible (as applied to ...]

Insert definitions for the following:

Errata.

An errata is an editorial correction to a specific edition of an NFPA Code or Standard that is published by NFPA and included in any future distribution of the Code or Standard.

Tentative Interim Amendment (TIA).

A Tentative Interim Amendments is an emergency amendment to a specific edition of an NFPA Code or Standard that is published by NFPA.

Statement of Problem and Substantiation for Public Input

Definition are term that are tied to PI 1351 and should be defined if an FR is created based on PI 1351.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1351-NFPA 70-2023 [New Section after 90.7]	PI 1351 contains the core text for the definitions in PI 1352.
Public Input No. 1351-NFPA 70-2023 [New Section after 90.7]	

Submitter Information Verification

Submitter Full Name: Anthony Apfelbeck
Organization: Altamonte Springs Building and Fire Safety Department
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 10 14:13:13 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Errata and Tentative Interim Amendments (TIAs) are posted on the NFPA website. For NFPA 70, these can be found at www.nfpa.org/70.

Public Input No. 1202-NFPA 70-2023 [New Definition after Definition: Conductor, Insulated. (Ins...]

Conductor, Line (Line Conductor)

An ungrounded conductor from a single phase system that originates from a single winding. For the purpose of this section, a split secondary in a multi-voltage transformer is considered a single winding.

Informational Note: A single phase panel fed from two phases of a three phase system has phases. A single phase panel fed from a 120/240 volt transformer has lines.

Statement of Problem and Substantiation for Public Input

The NEC uses both words but there is no definition. The word "Phase" can mean "time displacement." In a single winding system, the Lines are perfectly in phase. I use the example of a see-saw at a playground. One side goes up while the other goes down, but they are on the same board. It is impossible for a board to be "out of phase" with itself. The word "Phase" should only be used for an ungrounded conductor of a three-phase system. Here, the ungrounded conductors are in time displacement from the other conductors of the system.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1203-NFPA 70-2023 [New Definition after Definition: Conductors, Outdoor Overhe...]	

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jun 25 16:51:18 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: This term is commonly used in the electrical industry and does not need to be defined in the NEC. It is not clear that the term is misunderstood in the industry.

Public Input No. 1203-NFPA 70-2023 [New Definition after Definition: Conductors, Outdoor Overhe...]

Conductor, Phase (Phase Conductor)
an ungrounded conductor from a three phase system. A Phase conductor is also a Line conductor.

Statement of Problem and Substantiation for Public Input

This is a companion PI to a PI for "Line Conductor." The NEC uses both 'Phase' and 'Line' but there have not been definitions for these.
A Phase conductor is also a Line conductor. A Line conductor, however, is only a Phase conductor if it originates from a three phase system. There have been PIs, in the past, that have recommended combining the terms into one. So far, the CMP has not changed the text of the NFPA to use only one term. These PIs, however, have indicated that the terms are not always well understood in the industry.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1202-NFPA 70-2023 [New Definition after Definition: Conductor, Insulated. (Ins...]	Two new definitions: Line Conductor and Phase Conductor

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jun 25 17:05:58 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: This term is commonly used in the electrical industry theory and does not need to be defined in the NEC. It is not clear that the term is misunderstood in the industry.

Public Input No. 4305-NFPA 70-2023 [New Definition after Definition: Load Management.]

Load-Side

Electrical equipment and conductors after a disconnecting means where overcurrent protection is provided.

Statement of Problem and Substantiation for Public Input

The words load side is used 132 times throughout the NEC. A definition will bring clarity for Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 10:35:41 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The term “load side” is not only affiliated with a disconnecting means where overcurrent is provided. The recommended definition does not accurately encompass all load side scenarios.

Public Input No. 1371-NFPA 70-2023 [New Definition after Definition: Photovoltaic Cell (PV). (S...]

TITLE OF NEW CONTENT Physical Damage

Damage that plausibly creates a risk to equipment's function or safety.

Statement of Problem and Substantiation for Public Input

The dictionary definition is too broad to match the way we use the term, and Article 100 is intended to establish shared understandings of "we know what we mean" special uses of language.

Section 90.2(B) tell us that the NEC is not concerned with everything that the dictionary would call physical damage, which could include aesthetic blemishes such as scratched paint that hasn't been restored to look the same as before, or trivial dings. Article 100's Scope statement says that when the common definition of terms isn't quite what we mean. they are defined here.

I have not been able to find out why we shifted from using the term "injury" to "mechanical injury," and then, in the 1959 edition, "physical damage." However, the NEC is so long that even an adjective needs to carry a meaning, a consistently understood meaning. It hasn't.

When the global removal of "physical" was proposed in 2007, there was some disagreement about what "physical damage" meant. For instance, was loss of EMF shielding or filtering from vulnerable equipment to be considered non-physical damage (A2007 ROP 7-94)? Did the word "Physical" restrict it from meaning any likelihood at all of damage in any environment (A2007 ROP 8-4)?

Now that definitions have been moved to Article 100, it would be useful to establish a consistent understanding that fits the purpose set out in Article 90. The modifier "Physical" lets us indicate this has a special meaning beyond Merriam-Webster. I suggest it be restricted to plausible damage affecting the function or safety of a particular installation.

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 11 12:47:21 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: "Physical damage" is a subjective term that is not enforceable.

Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]

Prefabrication.

A manufacturing or construction process that generally takes place, either onsite or remote, at a specialized facility, where materials are assembled to form a component part of a final installation onsite. Prefabrication often involves the work of a single craft but could involve multiple trades.

Statement of Problem and Substantiation for Public Input

Prefabrication is becoming very common in construction and is a means of producing electrical installations and equipment in controlled environment to result in consistent quality and safe electrical installations. Challenges of obtaining approvals have been identified, thus creating a need to include prefabrication processes in the NEC. This new definition can serve as a base definition for the term used in proposed new rules in the NEC that address examination for safety and suitability criteria for prefabrications electrical equipment and installations. Proposed revisions to 90.7 and a proposed new 110.3(D) provide requirements that help address this gap in the Code and address current challenges related to ever-expanding prefabrication processes in electrical construction.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]	
Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]	
Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]	
Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]	
Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]	
Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 15:04:59 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Not all prefabrication is a manufacturing or construction process. The proposed definition has mandatory requirements in violation of 2.1.2.5 of the NEC Style Manual.

Public Input No. 4307-NFPA 70-2023 [New Definition after Definition: Support Areas.]

Supply-Side
Electrical equipment and conductors ahead of a disconnecting means with no overcurrent protection.

Statement of Problem and Substantiation for Public Input

The words supply side is used 125 times throughout the NEC. A definition will bring clarity for Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 10:41:43 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The term “supply side” is not only affiliated with a disconnecting means where overcurrent is provided. The recommended definition does not accurately encompass all supply side scenarios.

Public Input No. 3480-NFPA 70-2023 [New Definition after Definition: Switching Device(as applie...]

System, piping

Any piping other than isolated sections used to extend nonmetallic piping or to serve as protective sleeves or supports.

Statement of Problem and Substantiation for Public Input

At various places, mainly in Articles 110 and 250, there are references to piping systems, usually but not always water piping systems. If the presently undefined term "piping system" is needed, it will be helpful to set bounds on it. Applying the dictionary definition of "system" is problematic. If a building's water pipes are a mix of metal and nonmetallic, at what point is an inspector to dismiss bonding requirements because it no longer is an internal metal "system"?

The term "isolated sections" begs definition, but the NEC employs the term "isolated" elsewhere and leaves it to local, context-dependent judgment.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3482-NFPA 70-2023 [Section No. 250.32(D)]	
Public Input No. 3483-NFPA 70-2023 [Section No. 250.52(A)(8)]	

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Sun Sep 03 22:48:04 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The term “piping system” is not always used as indicated in the substantiation or the proposed definition. For examples see 280.24(A)(1), 427.13 and 514.3(C)(1). The proposed definition does not add clarity. “Sleeves” and “supports” do not align with the proposed term.

Public Input No. 4088-NFPA 70-2023 [New Definition after Definition: Unit Equipment.]

Utility.

An organization or enrirt responsible for engineering and supervision, including design, construction, generation, operation and maintenance of public electric supply, communications, area or street lighting, or railroad operational systems.

Informational Note No . 1: Examples of utilities include those entities that are typically designated or recognized by gov ernmental law or regulation by service/utility commissions and that install, operate, and maintain electric supply (such generation, transmission, or distribution systems) or communications systems (such as telephone, CATV, Internet, Satellite, or Data services).

Informational Note No . 2: Utilities are often subject to compliance with codes and standards covering their regulated activities as adopted under government law or regulation. Additional information can be found through consultation with the appr opriate governmental bodies, such as *State Regulatory Commissions* , *Public Service Commissions* , *The Federal En ergy Regulatory Commission* , and *Federal Communications Commission* .

Statement of Problem and Substantiation for Public Input

The term utility is used multiple times in NEC, but it is not defined. The NEC requirements that use the term can be confusing without a clear definition of what constitutes a utility company and the services they provide, and how they are regulated. NEC rules that mention the term “utility” are expanding exponentially relate to utility power sources, such as microgrids, interconnected power production sources and so forth. It seems may understand what a utility is and the know it when they see it, but there is no clear definition of the term. The new definition will help provide the needed distinguishing factors that result in more accurate application of the NEC and assist with determinations of wiring installations that are covered by the NEC and those that are not, as provided in Section 90.2. The source text for the proposed definition is actually derived from the National Electrical Safety Code (NESC) with slight modifications to apply in a broad nature in the NEC and without containing requirements to comply with the NEC Style Manual. The two informational notes are important and are not new information, they are derived from the existing Informational Note following Section 90.2(B). These informational notes provide more detailed descriptions of what constitutes a utility. Utilities are often subject to compliance with applicable codes and standards covering their regulated activities as adopted under governmental law or regulation by governmental bodies, such as state regulatory commissions, the Federal Energy Regulatory Commission, and the Federal Communications Commission(s).

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 16:16:07 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed definition has mandatory requirements in violation of 2.1.2.5 of the NEC Style Manual. The proposed informational notes are in violation of the NEC Style Manual. Per 2.1.10.2, informational notes shall not be written in mandatory language and shall not contain requirements, make interpretations, or make recommendations.

Public Input No. 1208-NFPA 70-2023 [New Definition after Definition: Voltage, High. (High Volta...]

TITLE OF NEW CONTENT

Voltage, Prevalent (Prevalent Voltage) - Voltage in the range of 50 volts AC to 1000 Volts AC or 75 volt DC to 1500 volts DC. CMP 3

Statement of Problem and Substantiation for Public Input

Currently there is no term or definition for voltages in the range from 50 volts to 1000 volts. To apply NEC requirements it is necessary to use terms that are clearly understood by users and enforcers of the NEC.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1210-NFPA 70-2023 [Definition: Voltage, Low. (Low Voltage).]	

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: Robert Jones
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jun 25 18:28:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The term “prevalent voltage” is not currently used in the Code. Adequate substantiation for the addition of the term has not been provided.

Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work Surface.]

Workmanship.
The skill and quality demonstrated in the creation, construction, and/or execution of a task or project, encompassing the level of care, attention to detail, and expertise employed.

Statement of Problem and Substantiation for Public Input

Workmanship is an egalitarian term, that focuses on evaluating the craftsmanship of any individual or group, the overall standard of work, precision, and dedication put forth in achieving a desirable outcome regardless of gender.

While the terminology found in NEC Section 110.12 was modified in for the 2023 edition, there are still multiple occurrences of the term “Workmanship” throughout the NEC®. These occurrences warrant the term being defined in Art. 100. The terms Professional and Skillful pertain to character traits, and do not pertain to the quality of an installation. Thus, making Section 110.12 more subjective and difficult to enforce.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1596-NFPA 70-2023 [Section No. 110.12]	
Public Input No. 1630-NFPA 70-2023 [Section No. 393.14]	
Public Input No. 1632-NFPA 70-2023 [New Section after 393.21]	
Public Input No. 1669-NFPA 70-2023 [New Section after 600.24]	
Public Input No. 1668-NFPA 70-2023 [Section No. 600.24]	
Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)]	
Public Input No. 1687-NFPA 70-2023 [Section No. 722.24]	
Public Input No. 1692-NFPA 70-2023 [New Section after 724.21]	
Public Input No. 1691-NFPA 70-2023 [Section No. 724.24]	
Public Input No. 1696-NFPA 70-2023 [New Section after 725.21]	
Public Input No. 1697-NFPA 70-2023 [Section No. 725.24]	
Public Input No. 1699-NFPA 70-2023 [New Section after 726.12]	
Public Input No. 1700-NFPA 70-2023 [Section No. 726.24]	
Public Input No. 1702-NFPA 70-2023 [Section No. 760.24]	
Public Input No. 1707-NFPA 70-2023 [Section No. 770.24]	
Public Input No. 1709-NFPA 70-2023 [Section No. 800.24]	
Public Input No. 1596-NFPA 70-2023 [Section No. 110.12]	
Public Input No. 1630-NFPA 70-2023 [Section No. 393.14]	
Public Input No. 1632-NFPA 70-2023 [New Section after 393.21]	
Public Input No. 1668-NFPA 70-2023 [Section No. 600.24]	
Public Input No. 1669-NFPA 70-2023 [New Section after 600.24]	
Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)]	
Public Input No. 1687-NFPA 70-2023 [Section No. 722.24]	
Public Input No. 1692-NFPA 70-2023 [New Section after 724.21]	
Public Input No. 1696-NFPA 70-2023 [New Section after 725.21]	
Public Input No. 1697-NFPA 70-2023 [Section No. 725.24]	
Public Input No. 1699-NFPA 70-2023 [New Section after 726.12]	
Public Input No. 1700-NFPA 70-2023 [Section No. 726.24]	
Public Input No. 1702-NFPA 70-2023 [Section No. 760.24]	
Public Input No. 1707-NFPA 70-2023 [Section No. 770.24]	
Public Input No. 1709-NFPA 70-2023 [Section No. 800.24]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 15:20:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: “Workmanship” is synonymous to “workmanlike,” which is classified as an unenforceable term in the NEC Style Manual.

Public Input No. 3882-NFPA 70-2023 [Section No. 110.1]

110.1 Scope.

This article covers general requirements for the examination and approval, installation and use, access to and spaces about electrical conductors and equipment; enclosures intended for personnel entry; and tunnel installations.

Informational Note: See Informative Annex J for information regarding ADA accessibility design.

Informational Note 2: For additional information regarding electrical safety IEEE 3007.3 (2012) Recommended Practice for Electrical Safety in Industrial and Commercial Power Systems.

Statement of Problem and Substantiation for Public Input

The stronger the linkage between the NFPA and IEEE on electrical power technology the better. This document is one of several that replaces content in ANSI/IEEE 241 Recommended Practice for Electric Power Systems in Commercial Buildings -- the so-called “Gray Book”; and the ANSI/IEEE 141 Recommended Practice for Power Distribution for Industrial Plants -- the so-called “Red Book”; both of which are now being sunsetted and superseded by 3007.3.

IEEE 3000 Standards Collection™ is the trademarked name of the family of industrial and commercial power systems standards formerly known as IEEE Color Books. The IEEE 3000 Standards Collection overall includes the same content as the Color Books that have been referenced into previous editions of the NEC but is now organized into approximately 70 IEEE “dot” standards that cover specific technical topics.

This method of development, of capturing and quickly conveying leading practice from transactions among academic experts and practitioners into our industry, supports the NFPA International mission of eliminating death, injury, property and economic loss due to fire, electrical and related hazards. Details about this document is available at the link below:

https://standards.ieee.org/findstds/standard/3007.3-2012.html

Submitter Information Verification

Submitter Full Name: Michael Anthony
Organization: Standards Michigan LLC
Affiliation: IEEE Education & Healthcare Facilities Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 09:01:19 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: There seems to be a word missing in the recommendation. Regardless, per 2.1.10.1 of the NEC Style Manual, if an informational note is needed to explain the text of the document, consideration shall be given to rewriting the text of the document to make the rule clear. The rule is clear and the recommended informational note is not needed to explain the text of the document.

Public Input No. 4271-NFPA 70-2023 [New Section after 110.2]

110.2+ Reliability. Availability of power source is an essential characteristic. Refer to IEEE 1366 Guide for Electric Power Distribution Reliability Indices to determine whether the reliability of the power source is appropriate for the occupancy classification

Informational Note: Other reliability related titles in the IEEE Standards Catalog:

IEEE 2800-2022 Standard for Interconnection and Interoperability of Inverter-Based Resources (IBRs) Interconnecting with Associated Transmission Electric Power Systems

IEEE 1547-2018 Standard for Interconnecting Distributed Energy Resources with Electric Power Systems:

IEEE Std 1364 2017 Guide for Electric Power Distribution Reliability Reporting Procedures:

IEEE 3006.1 Recommended Practice for Reliability Planning and Design of Industrial and Commercial Power Systems:

Statement of Problem and Substantiation for Public Input

Loss of electrical power presents a far more frequent hazard than wiring fire safety. I follow almost all standards action at municipal, county, state and federal level and lament the absence of local electrical professionals who understand hazards to communities. I understand that this proposal opens onto a minefield of sensitivities -- i.e. expanding the scope of the NEC beyond building premises to community electrical safety overall.

Submitter Information Verification

Submitter Full Name: Michael Anthony
Organization: Standards Michigan LLC
Affiliation: StandardsMichigan.COM
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 09:05:30 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed text is a design consideration. See 90.2(A) and (B) regarding practical safeguarding and adequacy where it states, in part, that this Code is not intended as a design specification and compliance therewith is not necessarily adequate for good service. The proposed input language does not align with the NEC Style Manual per 4.2.

Public Input No. 2958-NFPA 70-2023 [Section No. 110.2]

110.2 Approval.

The conductors and equipment required or permitted by this *Code* shall be acceptable only if approved. Listed equipment installed and used in accordance with its listing shall be approved.

Informational Note: See 90.7, Examination of Equipment for Safety, and 110.3, Examination, Identification, Installation, and Use of Equipment. See definitions of *Approved, Identified, Labeled,* and *Listed*.

Statement of Problem and Substantiation for Public Input

The present scope of 110.2 is excessively broad. An AHJ could, for example, decide that it would only approve Brand X of some component, excluding all other manufacturers. When a component has been independently tested and approved by a third party listing organization, and is being used in accordance with its listing, its use should be acceptable to all jurisdictions.

Submitter Information Verification

Submitter Full Name: Wayne Whitney
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 28 13:14:37 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The requirement related to approval is clear and the listing requirement is only part of the approval process and would only make this section unclear or incomplete. See Section 110.3 for listing requirements.

Public Input No. 1057-NFPA 70-2023 [New Section after 110.3]

Units of Measurement

For calculations involving amperes, calculations resulting in a fraction of less than 0.5 shall be rounded down to the next whole number. Calculations resulting in a fraction of 0.5 or more shall be rounded up to the next whole number.

Additional Proposed Changes

File Name	Description	Approved
NEC_2026_PI_-_Units_of_Measurement_-_Signed.pdf	PI - Form - Units of Measurement - Signed	

Statement of Problem and Substantiation for Public Input

Currently, Art 220.5(B) carries under Calculations, Fractions of Ampere. Art 220 is mostly visited by installers for commercial and residential applications, but not so much for designers and engineers in industrial facilities. The layout is mostly based on transformer sizes. For example, a new MCC line-up is added to the site. The electrical loading of the transformer allows to add an additional 1250kVA out of the 2500kVA total rating. The electrical loads that will be fed of the new MCC line-up will be added up based on the assumption that the motors will be running continuously. Using T430.250, the FLAs are used to determine the total load. Art 220 will be skipped entirely. Also, calculations in all other articles and associated sections of the NEC should be addressing how to handle fractions. This applies for example to Art 230, 240, 250, 430, 440, 450 etc.

Relocation Art 220.5(B) to Art 110 Part I General, will allow this rule to apply globally and make it clear that numbers need be rounded, unless otherwise permitted in this Code.

The language chosen is also harmonized with the language used in UL 508A and other UL Standards. Harmonizing the language always leads to less confusion when working with multiple standards.

The related companion PI to delete the test from Art 220.5(B) is 1039-NFPA 70-2023

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1039-NFPA 70-2023 [Section No. 220.5(B)]	Companion PI to delete associated section in Art 220.5(B)
Public Input No. 1039-NFPA 70-2023 [Section No. 220.5(B)]	

Submitter Information Verification

Submitter Full Name: Mark Pisani
Organization: Basf Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 13 06:07:37 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The submitter has not adequately substantiated why a requirement for rounding a calculation involving amperes needs to be a general requirement in Article 110.

NFPA Public Input Form

NOTE: All Public Input must be received by 5:00 pm EST/EDST on the published Public Input Closing Date.

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249 or visit www.nfpa.org/codes.

For technical assistance, please call NFPA at 1-800-344-3555

FOR OFFICE USE ONLY

Log #:

Date Rec'd:

Date **Name** Mark K Pisani **Tel. No.**

Company BASF **Email**

Street Address **City** **State** **Zip**

Please indicate organization represented (if any)

1. (a) Title of NFPA Standard National Electrical Code **NFPA No. & Year** 70-2026

(b) Section/Paragraph 110

2. Public Input Recommends (check one): ☒ new text ☐ revised text ☐ deleted text

3. Proposed Text of Public Input (include proposed new or revised wording, or identification of wording to be deleted):
[Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

Units of Measurement

For calculations involving amperes, calculations resulting in a fraction of less than 0.5 shall be rounded down to the next whole number. Calculations resulting in a fraction of 0.5 or more shall be rounded up to the next whole number.

4. Statement of Problem and Substantiation for Public Input: (Note: State the problem that would be resolved by your recommendation; give the specific reason for your Public Input, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

Currently, Art 220.5(B) carries under Calculations, Fractions of Ampere. Art 220 is mostly visited by installers for commercial and residential applications, but not so much for designers and engineers in industrial facilities. The layout is mostly based on transformer sizes. For example, a new MCC line-up is added to the site. The electrical loading of the transformer allows to add an additional 1250kVA out of the 2500kVA total rating. The electrical loads that will be fed of the new MCC line-up will be added up based on the assumption that the motors will be running continuously. Using T430.250, the FLAs are used to determine the total load. Art 220 will be skipped entirely. Also, calculations in all other articles and associated sections of the NEC should be addressing how to handle fractions. This applies for example to Art 230, 240, 250, 430, 440, 450 etc.

Relocation Art 220.5(B) to Art 110 Part I General, will allow this rule to apply globally and make it clear that numbers need be rounded, unless otherwise permitted in this Code.

The language chosen is also harmonized with the language used in UL 508A and other UL Standards. Harmonizing the language always leads to less confusion when working with multiple standards.

The related companion PI to delete the test from Art 220.5(B) is 1039-NFPA 70-2023

5. Copyright Assignment

(a) ☒ I am the author of the text or other material (such as illustrations, graphs) proposed in the Public Input.

(b) ☐ Some or all of the text or other material proposed in this Public Input was not authored by me. Its source is as follows: (please identify which material and provide complete information on its source)

I hereby grant and assign to the NFPA all and full rights in copyright in this Public Input (including both the Proposed Text and the Statement of Problem and Substantiation). I understand that I acquire no rights in any publication of NFPA in which this Public Input in this or another similar or analogous form is used. Except to the extent that I do not have authority to make an assignment in materials that I have identified in (b) above, I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this assignment.

Signature (Required) Mark K Pisani

PLEASE USE SEPARATE FORM FOR EACH PUBLIC INPUT

To: Secretary, Standards Council National Fire Protection Association
1 Batterymarch Park · Quincy, MA 02169-7471 OR
Fax to: (617) 770-3500 OR Email to: proposals_comments@nfpa.org

6/13/2023

Public Input No. 1573-NFPA 70-2023 [Section No. 110.3]

110.3 Examination, Identification, Installation, Use, and Listing (Product Certification) of Equipment.

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) ~~Cybersecurity for network-connected life safety equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality~~

~~Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates* , which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.~~

(9) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

(B) Installation and Use.

Equipment that is listed, labeled, or both, or identified for a use shall be installed and used in accordance with any instructions included in the listing, labeling, or identification.

Informational Note: The installation and use instructions may be provided in the form of printed material, quick response (QR) code, or the address on the internet where users can download the required instructions.

(C) Listing.

Product testing, evaluation, and listing (product certification) shall be performed by recognized qualified electrical testing laboratories and shall be in accordance with applicable product standards recognized as achieving equivalent and effective safety for equipment installed to comply with this *Code*.

Informational Note: The Occupational Safety and Health Administration (OSHA) recognizes qualified electrical testing laboratories that perform evaluations, testing, and certification of certain products to ensure that they meet the requirements of both the construction and general industry OSHA electrical standards. If the listing (product certification) is done under a qualified electrical testing laboratory program, this listing mark signifies that the tested and certified product complies with the requirements of one or more appropriate product safety test standards.

(D) Cybersecurity.

Cybersecurity for network connected life safety equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality. This evaluation shall be documented, and documentation shall be available to the AHJ for confirmation of compliance. This evidence of the evaluation shall not contain any information that may compromise the cybersecurity of the network connected equipment.

Informational Note: See ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards that provided framework to mitigate current and future security, cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.

Statement of Problem and Substantiation for Public Input

The need to address cybersecurity is important and should be required for electrical installations by the NEC. More guidance to aid AHJ in the enforcement of this requirement is needed. Adding language requiring documentation and providing guidance to installer and enforcer on what documentation is needed for compliance (similar to Section 500.4) is imperative in making this rule enforceable.

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 15:24:27 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The appropriate location for cyber security is 110.3(A)(8) and the proposed text is not necessary.

Public Input No. 1242-NFPA 70-2023 [Section No. 110.3(A)]

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) Cybersecurity for network-connected life safety equipment and critical infrastructure to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality

Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates*, which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.

Informational Note No. 4: Examples of critical infrastructure include, but are not limited to, waste water treatment facilities, water utilities, police stations, call centers, financial centers, data centers, telecommunication facilities, and military bases. Most critical infrastructure has not been designated as a "Critical Operations Power System" as detailed in Article 708

(9) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

Statement of Problem and Substantiation for Public Input

It is not only life safety equipment that must be protected from cyber attacks, but also the critical infrastructure that helps keep us safe from danger. One horrific example would be Chicago if its waste water treatment and water supply were shut down due to a cyber attack. When toilets won't flush and sewage begins backing up, it is not only an unhealthy situation but one in which riots are likely to occur.

Examples of critical infrastructure are listed in a new Informational Note, along with an explanation that most critical infrastructure is not designated as COPS per Article 708.

Submitter Information Verification

Submitter Full Name: Vincent Saporita
Organization: Saporita Consulting
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jun 29 20:22:02 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Critical infrastructure application articles may have additional requirements and are more specific to those systems and therefore should not be covered by the general rules in Article 110.

Public Input No. 3375-NFPA 70-2023 [Section No. 110.3(A)]

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) Cybersecurity for network-connected life safety and additional controllable equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality

Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates*, which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.

(9) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

Statement of Problem and Substantiation for Public Input

The cybersecurity examination requirements for life safety equipment such as fire alarms, access control, emergency signaling, etc. provide protection against external threats. However, do not currently provide for examination of other electrical equipment that could be controlled from an external network. Examples of these systems could be network connected IOT based DER, Power Distribution Equipment, Energy Management Systems, etc. These systems are also the subject of cybersecurity attacks. Adding this additional examination requirement will provide for proper cybersecurity protection

Additional Cybersecurity information on these topics

Cyber Attacks on Critical Infrastructure – June 2016
https://commercial.allianz.com/news-and-insights/expert-risk-articles/cyber-attacks-on-critical-infrastructure.html

Operational Technology Cyberattacks and the 2023 Threat Landscape – S. Singh April 2023
https://blogs.blackberry.com/en/2023/04/operational-technology-cyberattacks-and-2023-threat-landscape

Cybersecurity Considerations for DER on the U.S. Grid, DOE October 2022
https://www.energy.gov/sites/default/files/2022-10/Cybersecurity%20Considerations%20for%20Distributed%20Energy%20Resources%20on%20the%20U.S.%20Electric%20Grid.pdf

NREL Cybersecurity & DER's - DERs include wind, solar, battery storage, and other small-scale power devices connected at the grid edge.
https://www.nrel.gov/docs/fy20osti/76307.pdf

The Cybersecurity Threats Facing Smart Buildings, C. Avey October 2022
https://facilitiesmanagementadvisor.blr.com/building-controls/the-cybersecurity-threats-facing-smart-buildings/

Submitter Information Verification

Submitter Full Name: Keith Waters
Organization: Schneider Electric
Street Address:
City:
State:
Zip:
Submittal Date: Fri Sep 01 15:35:30 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The submitter has not adequately substantiated the need to expand this examination requirement beyond its current life safety scope. The public input was too broad and encompassing and has the potential to lead to unintended consequences.

Public Input No. 3403-NFPA 70-2023 [Section No. 110.3(A)]

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) Cybersecurity for network-connected life safety equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality

Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates*, which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.

Informational Note No. 4: See NEMA *CY 10000 Cybersecurity Implementation Guidance for Connected Electrical Infrastructure* , for recommendations on how to meet this requirement.

(9) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

Statement of Problem and Substantiation for Public Input

The cybersecurity examination requirements for life safety equipment such as fire alarms, access control, emergency signaling, etc. do not currently provide recommendations on how to verify or examine these systems for cybersecurity. The NEMA document
provides the user with guidance on how to meet these requirements and others.

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat Sep 02 15:26:27 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9040-NFPA 70-2024

Statement: The additional Informational Note No. 4 in 110.3(A)(8) provides the user additional guidance on the evaluation process for cybersecurity.

Public Input No. 4428-NFPA 70-2023 [Section No. 110.3(A)]

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) Cybersecurity for network-connected life safety equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality

Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates*, which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.

Informational Note No. 4: See NFPA 70B for guidance on establishing proper Cybersecurity practices as nearly all Cybersecurity threats arise after installtion and final inspection.

(9) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

Statement of Problem and Substantiation for Public Input

Cybersecurity is primarily a maintenance issue, and thus should primarily be addressed in NFPA 70B. NFPA 72 has already moved forward with sensible Cybersecurity requirements, but it has the benefit of being a combined installation and maintenance standard. Because the NEC is split into 70 and 70B, we should have maintenance guidance in NFPA 70B. To that end, I will be submitting a Public Input to 70B very much in line with Chapter 11 of NFPA 72 2025 Second Draft to address these needs. This informational note will direct users to NFPA 70B and highlight the critical nature of proper cybersecurity maintenance practices.

Submitter Information Verification

Submitter Full Name: Jason Potterf
Organization: Cisco
Affiliation: ESTA
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 15:11:52 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: 70B does not address cybersecurity. NFPA 70 addresses the installation of network connected equipment that is associated with life safety systems.

Public Input No. 502-NFPA 70-2023 [Section No. 110.3(A)]

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) ~~Cybersecurity for network-connected life safety equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality~~

~~Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates* , which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.~~

(9) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

Statement of Problem and Substantiation for Public Input

Remove item (8) and its related informational note. The NFPA membership, manufacturers, and Code Panels (other than CMP-1) did not agree with Code Panel 1 that cybersecurity was best addresses in Article 110 as a general requirement rather than in specific articles. Accordingly, to correlate with the wishes of the NFPA Technical Session membership vote, manufacturers, and Code Panels other than CMP-1, this general requirement is unnecessary and should be removed to eliminate redundancy in the NEC and have this issue added as a requirement on a case-by-case basis based on the vote of an individual CMP based on the decision reached by each CMP for a particular NEC article. This recommendation is based on compliance with 4.1.1 of the 2023 NEC Style Manual (this section may have changed with an updated NEC Style Manual). Here it states, in part, that the use of redundant references shall be avoided.

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 21 17:23:16 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The redundant language in other critical infrastructure subject to cybersecurity attacks may need to be more specific than the general rule.

Public Input No. 7-NFPA 70-2023 [Section No. 110.3(A)]

(A) Examination.

In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with this *Code*

Informational Note No. 1: Equipment may be new, reconditioned, refurbished, or remanufactured.

Informational Note No. 2: Suitability of equipment use may be identified by a description marked on or provided with a product to identify the suitability of the product for a specific purpose, environment, or application. Special conditions of use or other limitations and other pertinent information may be marked on the equipment, included in the product instructions, or included in the appropriate listing and labeling information. Suitability of equipment may be evidenced by listing or labeling.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided

(3) Wire-bending and connection space

(4) Electrical insulation

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects

(7) Classification by type, size, voltage, current capacity, and specific use

(8) Cybersecurity for network-connected life safety equipment to address its ability to withstand unauthorized updates and malicious attacks while continuing to perform its intended safety functionality

Informational Note No. 3: See the ANSI/ISA 62443 series of standards for industrial automation and control systems, the UL 2900 series of standards for software cybersecurity for network-connectable products, and UL 5500, *Standard for Remote Software Updates*, which are standards that provide frameworks to mitigate current and future security cybersecurity vulnerabilities and address software integrity in systems of electrical equipment.

(9) Ability and likelihood of the equipment to cause or suffer damage as a result of manipulation and operation by ghosts.

(10) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment

Statement of Problem and Substantiation for Public Input

Continuing the trend with this list.

Last revision cycle we had apocalyptic prophets of doom trying to add that every electrical inspector needed to consider the possible effects of a EMP weapon on premises electrical distribution equipment that would not deliver power if generation were wiped out by such an event.

Last revision cycle the cyber security prophets of doom originally intended to insert a clause that would have applied to electrical installations generally, and would have confused the community and generated revenue for do nothing consultants. The clause would have lead to false senses of security, and jeopardized safety by allowing inspectors that work for myriads of localities and are subject to varying public record laws, varying legal support resources, and varying levels of organizational strength; to require disclosure of studies they may not know how to read -- studies that likely if disclosed could expose vulnerabilities that in reality can not be fully mitigated if we are going to have online systems. NFPA responded by including something that should be in an entirely different standard, or at least in a different chapter of the NEC. They added a section in article 110 (general requirements) that would apply to special installations like certain healthcare settings, which has a cause about cyber security/cyber weapon hardiness.

Here's to continue the trend.

Submitter Information Verification

Submitter Full Name: John Doe
Organization: [Not Specified]
Street Address:

City:
State:
Zip:
Submittal Date: Tue Jan 03 20:30:43 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Although ghosts are real, they do not affect electrical systems.

Public Input No. 1865-NFPA 70-2023 [New Section after 110.3(B)]

110.3 B - Exception

Add exception language to 110.3 (B) allowing installation of equipment, etc.; in this case installing a grounding type receptacle without connecting the grounding type receptacle to an equipment grounding/bonding conductor, if expressly permitted elsewhere within the NEC.

Statement of Problem and Substantiation for Public Input

110.3 (B) Exception (NEW) - Article 406.4 (D) (2) (c) allows under certain conditions the installation of a grounding type receptacle on a branch circuit which does not have an equipment grounding conductor. Manufacturer installation instructions show connecting the grounding type receptacle to an equipment grounding/bonding conductor. I have not aware of manufacturer installations instructions that read along the lines of "...connect non-self-grounding receptacle to an equipment grounding/bonding conductor if available to the grounding terminal of the receptacle…." Installing a grounding type receptacle (not self-grounding) on a non-grounded branch circuit as outlined by 406.4 (D) (2) (c) appears to be a violation of article 110.3 (B).

Submitter Information Verification

Submitter Full Name: Gary Hein
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 06 16:56:04 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Public Input shall comply with 4.3.4.1(c) of the Regulations. The proposed text of the Public Input must include the wording to be added.

Public Input No. 1866-NFPA 70-2023 [New Section after 110.3(B)]

110.3 (B) Exception snap switches

Add exception language to 110.3 (B) allowing installation of equipment, etc.; in this case installing a grounding type snap switch without connecting the grounding type snap switch to an equipment grounding/bonding conductor, if expressly permitted elsewhere within the NEC.

Statement of Problem and Substantiation for Public Input

110.3 (B) Exception (NEW) - Article 404.9 (B) exception no. 1 allows under certain conditions the installation of a grounding type snap switch on a branch circuit which does not have an equipment grounding conductor. Manufacturer installation instructions show connecting the grounding type snap switch to an equipment grounding/bonding conductor. I am not aware of manufacturer installations instructions that read along the lines of "...connect non-self- grounding type snap switch to an equipment grounding/bonding conductor if available to the grounding terminal of the snap switch…." Installing a grounding type snap switch (not self-grounding) on a non-grounded branch circuit as outlined by 404.9 (B) exception no. 1 appears to be a violation of article 110.3 (B).

Submitter Information Verification

Submitter Full Name: Gary Hein
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 06 17:01:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Public Input shall comply with 4.3.4.1(c) of the Regulations. The proposed text of the Public Input must include the wording to be added.

Public Input No. 1896-NFPA 70-2023 [Section No. 110.3(B)]

(B) Installation and Use.

Equipment that is listed, labeled, or both, or identified for a use shall be installed and used in accordance with any instructions included in the listing, labeling, or identification. The instructions included shall not conflict with the minimum safety requirements in this code.

Informational Note: The installation and use instructions may be provided in the form of printed material, quick response (QR) code, or the address on the internet where users can download the required instructions.

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.
Many times, it is believed that the installation instructions provided with listed, labeled, or identified electrical equipment takes precedence over the minimum safety requirements of this code. This change will assist users and enforcers with the intent of this code and eliminate confusion.

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 07 12:53:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9050-NFPA 70-2024
Statement: The revision makes it clear that product installation and use instructions shall not compromise safety and must also conform to the requirements of this Code.

Public Input No. 2160-NFPA 70-2023 [Section No. 110.3(B)]

(B) Installation and Use.

Equipment that is listed, labeled, or both, or identified for a use shall be installed and used in accordance with ~~any instructions included in the listing, labeling, or identification~~ the installation and use instructions from the manufacturer .

Informational Note: The installation and use instructions may be provided in the form of printed material, quick response (QR) code, or the address on the internet where users can download the required instructions.

Statement of Problem and Substantiation for Public Input

The general user does not have access to the instructions that are included with the listing. The general user only has access to the owner's manual. UL standards include a section that is to be included in the owner's manual. The informational note indicates "installation and use instructions." The parent text should use this same language.

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 13 22:34:26 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The revised text does not add clarity to the rule. Stating “a general user does not have access to instructions and only has access to the owner’s manual” has not been substantiated and does not support the suggested revision. The Panel concludes that the Informational Note provides several options for users to access installation instructions for this information.

Public Input No. 2401-NFPA 70-2023 [Section No. 110.3(B)]

(B) Installation and Use.

(1) Manufacturer's Instruction. Equipment that is listed, labeled, or both, or identified for a use shall be installed and used in accordance with any instructions included in the listing, labeling, or identification.

(2) Applicability. Where there is a conflict between a Code requirement and any instructions included in the listing, labeling, or identification, the Code requirement shall be applicable. Manufacturer's instruction shall be permitted to provide a more restrictive requirement but not waive any requirement in this Code.

Informational Note: The installation and use instructions may be provided in the form of printed material, quick response (QR) code, or the address on the internet where users can download the required instructions.

Statement of Problem and Substantiation for Public Input

There is no requirement to inform the authority having jurisdiction on how to handle a specific scenario where the manufacturer's instruction modifies or supplements a Code requirement to provide a lesser level of electrical safety. For example; if a product states GFCI or AFCI cannot be used with their equipment but the equipment is installed in a location where GFCI and AFCI is required, how is the AHJ to handle this? The Code is the minimum electrical safety standard and no instructions included in the listing, labeling, or identification of a given product should be able to lessen any Code requirement. This proposed language in new second level subdivision will ensure that.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 16:44:19 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9050-NFPA 70-2024
Statement: The revision makes it clear that product installation and use instructions shall not compromise safety and must also conform to the requirements of this Code.

Public Input No. 4259-NFPA 70-2023 [Section No. 110.3(B)]

(B) Installation and Use.

Equipment that is listed, labeled, or both, or identified for a use shall be installed and used in accordance with any instructions included in the listing, labeling, or identification. Instructions included with the equipment shall not lessen the requirments of this Code.

Informational Note: The installation and use instructions may be provided in the form of printed material, quick response (QR) code, or the address on the internet where users can download the required instructions.

Additional Proposed Changes

File Name	Description	Approved
GE_Waffer_Installation_Instructions.pdf	Wafer Installation Instruction Example	

Statement of Problem and Substantiation for Public Input

Some instructions included with listed products give direction that conflicts with Code requirements. For example, I have reviewed instructions with some appliances that direct that the appliance must not be installed on a GFCI protected circuit and these appliances are designed to be installed in kitchens where GFCI protection is required.

Instructions with "wafer" type recessed lighting directs the user to just place the associated junction box in the hole cut in the plaster ceiling which results in a "floating" part of the luminaire that should be secured in accordance with 410.30

Submitter Information Verification

Submitter Full Name: Peter Diamond
Organization: Diamond Seminars
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 08:30:48 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9050-NFPA 70-2024
Statement: The revision makes it clear that product installation and use instructions shall not compromise safety and must also conform to the requirements of this Code.

Public Input No. 1576-NFPA 70-2023 [New Section after 110.3(C)]

(X) Suitability.

Suitability of prefabricated equipment or electrical installations shall be permitted to 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 or engineering report.

(4) Evidence of compliance or approval by the applicable authority having jurisdiction or other inspection documentation.

Informational Note No. 1: Additional documentation for equipment may include certificates demonstrating compliance with applicable equipment standards and installation codes, indicating special conditions of use, and other pertinent information.

Informational Note No. 2: See NECA 5, *Recommended Practice for Prefabrication of Electrical Installations for Construction*, or other ANSI-approved installation standards for prefabrication types and recommended practices for quality control and inspections.

Additional Proposed Changes

File Name	Description	Approved
NECA_05-2022.pdf	NECA 5, Recommended Practice for Prefabrication of Electrical Installations for Construction.	

Statement of Problem and Substantiation for Public Input

Prefabrication is very common in construction and is a means of producing electrical installations and equipment in controlled environment to result in consistent quality and safe electrical installations. Challenges of obtaining approvals have been identified, thus creating a need to include prefabrication processes in the NEC. Criteria for establishing suitability and approving prefabricated electrical installations is needed in the NEC. This expansion of 110.3 in the NEC provides various means for examination for safety and suitability for approvals of prefabrications electrical equipment and installations. The proposed new section has been tailored after the existing requirements contained in 500.8(A).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]	
Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]	
Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]	
Public Input No. 1560-NFPA 70-2023 [Section No. 90.4(A)]	
Public Input No. 1563-NFPA 70-2023 [Section No. 90.7]	
Public Input No. 1566-NFPA 70-2023 [New Definition after Definition: Power-Supply Cord.]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 15:37:56 EDT 2023

Committee: NEC-P01

Committee Statement

Resolution: This Code, when adopted by governmental bodies for legal jurisdiction over electrical installations, would apply to prefabricated electrical systems whether installed on or off site and subject to approval by the AHJ.

Public Input No. 2471-NFPA 70-2023 [New Section after 110.3(C)]

110.3(D) [NEW]

(D) Field Labeled

Field labeling shall be performed by a third-party field evaluation body (FEB) using the applicable product safety standard(s) and this Code.

Informational Note: The International Accreditation Service (IAS) recognizes Field Evaluation Bodies (FEBs) that perform field evaluations of certain equipment within their accredited scope to ensure that they meet the requirements of both NFPA 790 and NFPA 791. The field evaluation is performed using the applicable product standard(s)See Informative Annex A for a list of product safety standards that are compatible with this Code..

Statement of Problem and Substantiation for Public Input

Over the past couple of cycles, the term field labeled has been introduced and applicability has been expanded within the NEC. There are numerous requirements where equipment is to be listed, or field labeled. The proposed additional list item (D) provides clarification that the requirements of field labeling is to be performed by a field evaluation body and that the equipment field evaluation process is in accordance with appropriate product safety standard(s).

The new informational note provides users with information about field evaluation bodies that meet IAS AC354 criteria, and the applicable product standards used for the evaluation. .

IAS AC354 requires the accredited FEB to comply with:

· NFPA 790, Standard for Competency of Third-Party Field Evaluation Bodies.

· NFPA 791, Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation.

· ISO/IEC Standard 17020, Conformity assessment – Requirements for the operation of various types of bodies performing inspection.

· IAS Rules of Procedure for Field Evaluation Body accreditation.

· The FEB must apply for each product category desired to be included in the accredited scope as defined in NFPA 790, Appendix C.

Additionally, the applicable recommended practices and procedures in NFPA 791 are mandatory requirements for the purposes of the IAS accreditation.

Currently there are 16 IAS AC354 accredited FEBs. https://www.iasonline.org/services/field-evaluation-bodies/

Submitter Information Verification

Submitter Full Name: Jeffrey Fecteau
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 18:55:37 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The term ”field label” as it relates to evaluation of equipment is a well understood term and is not necessary for the general terms in Section 110.3. The submitter has not adequately substantiated why the proposed new list item (D) is necessary due to expanded use of this term in the Code.

Public Input No. 1592-NFPA 70-2023 [New Section after 110.4]

Table 110.4(A) Standard Nominal Low and Medium System Voltages and Voltage Ranges.

Table 110.4(A) Standard Nominal Low and Medium System Voltages and Voltage Ranges.

VOLTAGE CLASS	Nominal System Voltage (Note a)			Nominal Utilization Voltage (Note h)	Maximum
	2-wire	3-wire	4-wire	2-wire 3-wire 4-wire	Utilization and Service Voltage (Note b)
Low Voltage	**Single-Phase Systems**				
	120	**120/240**		**115** **115/230**	**126** **126/252**
	Three-Phase Systems				
		240 **480** 600 (Note d)	**208/120** (Note d) **240/120** **480/277** 690/400	**200** **230/115** **230** **460/266** **460** 575 660	**218/126** **252/126** **252** **504/291** **504** 630 (Note d) 720
Medium Voltage		2400 **4160** 4800 6900 **13800** 23000 34500 46000 **69000**	4160Y/2400 8320Y/4800 12000Y/6930 **12470Y/7200** **13200Y/7620** **13800Y/7970** 20780Y/12000 22860Y/13200 **24940Y/14400** **34500Y/19920**		2520 4370/2520 **4370** 5040 **7240** 8730Y/5040 12600Y/7270 **13090Y/7560** **13860Y/8000** **14490Y/8370** **14490** 21820Y/12600 24000Y/13860 24150 **26190Y/15120** **36230Y/20920** 36230

					Maximum Voltage (Note f)
					48300
					72500

Notes:

(1) Three-phase three-wire systems are systems in which only the three-phase conductors are carried out from the s connection, grounded or ungrounded. Three-phase four-wire systems are systems in which a grounded neutral c are designated by the phase-to-phase voltage, followed by the letter Y (except for the 240/120 delta system), a s single-phase or three-phase systems.

(2) For 120-600V nominal systems, voltages in this column are maximum service voltages. Maximum utilization v appropriate multiples thereof for other nominal system voltages through 600 volts.

(3) A modification of this three-phase, the four-wire system is available as a 120/208YV service for single-phase, t

(4) Certain kinds of control and protective equipment presently available have a maximum voltage limit of 600 vol

(5) Utilization equipment does not generally operate directly at these voltages. For equipment supplied through tra

(6) For these systems, Range A and Range B limits are not shown because, where they are used as service voltages load tap-changes to suit their requirements.

(7) Nominal utilization voltages are for low-voltage motes and control.

(8) Many 220V motors were applied to existing 208V systems on the assumption that the utilization voltage would 110.4(A) to existing 208V systems supplying such motors.

Statement of Problem and Substantiation for Public Input

The terminalogy surrounding voltage is often misused and voltage systems are misclassified. ANSI C84.1 has tables clearly defining what the standard nominal voltage systems are for 60 Hertz and what thier classifications are. By adding this text it will aid in proper classification and application of various systems and this text supports the additon of new tables in 110.4 see compainion PIs adding the new tables.
Voltage classification for equipment and systems covered by the NEC® are clarified within the appropriate voltage ranges as expressed in ANSI C84.1, Voltage Ratings (60 Hertz)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1577-NFPA 70-2023 [Section No. 110.4]	
Public Input No. 1599-NFPA 70-2023 [Section No. 110.34(C)]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 26 16:37:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The voltage classifications are not correlated with the use of voltages with this code. The term 1000V or less Or Over 1000 V Are the terms used throughout the code.

Public Input No. 1593-NFPA 70-2023 [New Section after 110.4]

Table 110.4(B) Standard Nominal High, Extra-High, and Ultra-High System Voltages and Voltage Ranges.

Table 110.4(B) Standard Nominal High, Extra-High, and Ultra-High System Voltages and Voltage Ranges.

VOLTAGE CLASS	Nominal System Voltage (Note a)			Nominal Utilization Voltage (Note g)	Maximum Voltage (Note f)
	2-wire	3-wire	4-wire		
High Voltage		**115000** **138000** **161000** **230000**			**121000** **145000** **169000** **242000**
Extra-High Voltage		**345000** 400000 **500000** **765000**			**362000** 420000 **550000** **800000**
Ultra-High Voltage		**1100000**			**1200000**

Notes:

(1) Three-phase three-wire systems are systems in which only the three-phase conductors are carried out from the source for connection of loads. The source may be derived from any type of three-phase transformer connection, grounded or ungrounded. Three-phase four-wire systems are systems in which a grounded neutral conductor is also carried out from the source for connection of loads. Four-wire systems in Table 110.4(A) are designated by the phase-to-phase voltage, followed by the letter Y (except for the 240/120 delta system), a slant line, and the phase-to-neutral voltage. Single-phase services and loads may be supplied from either single-phase or three-phase systems.

(2) For 120-600V nominal systems, voltages in this column are maximum service voltages. Maximum utilization voltages would not be expected to exceed 125 volts for the nominal system voltage of 120, nor appropriate multiples thereof for other nominal system voltages through 600 volts.

(3) A modification of this three-phase, the four-wire system is available as a 120/208YV service for single-phase, three-wire, open-wye applications.

(4) Certain kinds of control and protective equipment presently available have a maximum voltage limit of 600 volts; the manufacturer or power supplier or both should be consulted to assure proper application.

(5) Utilization equipment does not generally operate directly at these voltages. For equipment supplied through transformers, refer to limits for a nominal system voltage of transformer output.

(6) For these systems, Range A and Range B limits are not shown because, where they are used as service voltages, the operating voltage level on the user's system is normally adjusted by means of voltage regulators or load tap-changes to suit their requirements.

(7) Nominal utilization voltages are for low-voltage motes and control.

(8) Many 220V motors were applied to existing 208V systems on the assumption that the utilization voltage would not be less than 187V. Caution should be exercised in applying the Range B minimum voltages of Table 110.4(A) to existing 208V systems supplying such motors.

Statement of Problem and Substantiation for Public Input

The terminalogy surrounding voltage is often misused and voltage systems are misclassified. ANSI C84.1 has tables clearly defining what the standard nominal voltage systems are for 60 Hertz and what thier classifications are. By adding this text it will aid in proper classification and application of various systems and this text supports the additon of new tables in 110.4 see compainion PIs adding the new tables.
Voltage classification for equipment and systems covered by the NEC® are clarified within the appropriate voltage ranges as expressed in ANSI C84.1, Voltage Ratings (60 Hertz)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1577-NFPA 70-2023 [Section No. 110.4]	
Public Input No. 1599-NFPA 70-2023 [Section No. 110.34(C)]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 26 16:41:13 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The voltage classifications are not correlated with the use of voltages with this code. The term 1000V or less Or Over 1000 V Are the terms used throughout the code.

Public Input No. 1577-NFPA 70-2023 [Section No. 110.4]

110.4 Voltages.

The voltage considered shall be that at which the circuit operates. The voltage rating of electrical equipment shall not be less than the nominal voltage of a circuit to which it is connected. Standard nominal voltage classifications and voltage ratings for electrical equipment and electrical power systems shall be classified in accordance with (A) and (B):

(A) Standard Nominal Voltage Systems and Voltage Ranges - Low and Medium Voltages.

For standard nominal voltage systems and voltage ranges for low and medium voltage systems see Table 110.4(A).

(B) Standard Nominal Voltage Systems and Voltage Ranges - High, Extra-High, and Ultra-High Voltages.

For standard nominal voltage systems and voltage ranges for high, extra-high, and ultra-high voltage systems see Table 110.4(B).

Informational Note: For information on voltage classifications and voltage ratings see ANSI C84.1 *American National Standard for Electrical Power Systems and Equipment - Voltage Ratings (60 Hertz).*

Statement of Problem and Substantiation for Public Input

The terminalogy surrounding voltage is often misused and voltage systems are misclassified. ANSI C84.1 has tables clearly defining what the standard nominal voltage systems are for 60 Hertz and what thier classifications are. By adding this text it will aid in proper classification and application of various systems and this text supports the additon of new tables in 110.4 see compainion PIs adding the new tables.
Voltage classification for equipment and systems covered by the NEC® are clarified within the appropriate voltage ranges as expressed in ANSI C84.1, Voltage Ratings (60 Hertz)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1592-NFPA 70-2023 [New Section after 110.4]	PI for New Table 110.4(A)
Public Input No. 1593-NFPA 70-2023 [New Section after 110.4]	PI for New Table 110.4(B)
Public Input No. 1599-NFPA 70-2023 [Section No. 110.34(C)]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 25 15:46:48 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The voltage classifications are not correlated with the use of voltages with this code. The term 1000V or less Or Over 1000 V Are the terms used throughout the code.

Public Input No. 3054-NFPA 70-2023 [Section No. 110.4]

110.4 Voltages.

The voltage ~~considered shall be that at which the circuit operates. The voltage~~ rating of electrical equipment shall not be less than the nominal voltage of a circuit to which it is connected.

Statement of Problem and Substantiation for Public Input

Delete 'The voltage considered shall be that at which the circuit operates' since this is defined in Article 100 of Voltage of a Circuit.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:45:39 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The recommendation does not improve usability or clarity. The definition of "nominal voltage" and the accompanying informational note already clarifies the requirement.The recommendation does not improve usability or clarity. The definition of "nominal voltage" and the accompanying informational note already clarifies the requirement.

Public Input No. 3055-NFPA 70-2023 [Section No. 110.4]

110.4 Voltages.

The nominal system voltage ~~considered~~ shall be ~~that at which the circuit operates~~ listed or identified for the electrical equipment . The voltage rating of electrical equipment shall not be less than the nominal voltage of a circuit to which it is connected within a range that permits satisfactory operation of equipment .

Statement of Problem and Substantiation for Public Input

In accordance with “ANSI C84.1 Voltage Ratings for Electric Power Systems and Equipment (60 Hz)” utilization equipment voltage ranges from no more than 5% above the nominal system voltage and no less than 10% of nominal system voltage for the connected equipment. The revised language will make it clear to Code users that there are voltage ranges in which equipment can operate satisfactory without any electrical safety concern. Otherwise as currently written the requirement will make many electrical installations non-compliant with the NEC. For example, the voltage rating of electrical equipment like 115V, 230V, and 460V, will be less than the “nominal” voltage rating of 120V, 240V, and 460V. There should not be any concern that someone would place a 208V rated load on 240V nominal system because 110.3(B) requires equipment to be installed in accordance with manufacturer’s instructions. Equipment nameplates use utilization voltages and not nominal voltages. The utilization (nameplate) voltages of 115V, 200V, 230V, and 460V are intended to be used on systems with nominal voltages of 120V, 208V, 240V, and 480V respectively.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:46:39 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The recommendation does not improve usability or clarity. The definition of “nominal voltage” and the accompanying informational note already clarifies the requirement

Public Input No. 427-NFPA 70-2023 [Section No. 110.4]

110.4 Voltages.

The voltage considered shall be that at which the circuit operates. The voltage rating of electrical equipment shall ~~not be~~ conform to either 110.4(A) or 110.4(B)

(A) Be not less than the nominal voltage of the circuit to which it is connected

(B) Be identified for use at the nominal voltage of the circuit to which it is connected

informational note: An example of equipment that has a different voltage than the circuit to which it is connected is a motor .

Statement of Problem and Substantiation for Public Input

As 110.4 is currently written, it is a Code violation to connect a 460 volt motor to a 480 volt circuit. Or a 115 volt motor to a 120 volt circuit.

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sat Mar 04 22:30:56 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The recommendation does not improve usability or clarity. The definition of “nominal voltage” and the accompanying informational note already clarifies the requirement.

Public Input No. 2275-NFPA 70-2023 [Section No. 110.5]

110.5 Conductors.

Conductors used to carry current shall be of copper, aluminum, or copper-clad aluminum unless otherwise provided in this *Code*. ~~If the conductor material is not specified, the sizes given in this *Code* shall apply to copper conductors. If other materials are used, the size shall be changed accordingly.~~

Statement of Problem and Substantiation for Public Input

Throughout the Code there is no instance where the conductor material is not specified in the requirement itself. Deleting text would make the requirement simpler and bring clarity for Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 15 15:10:58 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The conductor material is not always stated in the requirements throughout the code.

Public Input No. 4263-NFPA 70-2023 [New Section after 110.6]

New Section After 110.6

Dc Load Calculations.

For dc equipment, volt-amperes (VA) shall be considered equivalent to watts (W), and kilovolt-amperes (kVA) shall be considered equivalent to kilowatts (kW), for loads calculated in accordance with this Code.

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of a Correlating Committee DC Task Group consisting of Danish Zia, Jason Fisher, Randy Dollar, Larry Wildermuth, Scott Higgins, Scott Harding, Mark Earley, Jason Hopkins, Christopher Vance, Chad Kennedy and Derrick Atkins. This Public Input, along with other Public Inputs, was developed with the goal of improving usability and accuracy on requirements associated with DC circuits.

Throughout the Code there are requirements for using “volt-ampere” ratings for conducting load calculations. However, DC rated equipment and DC loads are routinely rated in watts (W) and kilowatts (kW). For DC circuits, these parameters are equivalent to volt-amperes (VA) and kilovolt-amperes (kVA), respectively. This new section in Article 110 would recognize the electrical power equivalency and clarify the load calculation rules as applicable to DC rated equipment and DC loads throughout the Code.

Submitter Information Verification

Submitter Full Name: Danish Zia
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 08:54:17 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The information may be more relevant to the rules in Article 220 and not in the general requirements of Article 110.

Public Input No. 2243-NFPA 70-2023 [Section No. 110.8]

110.8 Wiring Methods.

Only wiring methods recognized as suitable are included in this *Code*. The recognized methods of wiring included in Chapter 3 shall be permitted to be installed in any type of building, occupancy, or premises wiring system, except as otherwise provided in this *Code*.

Statement of Problem and Substantiation for Public Input

This added text will clarify that this section is referring to Article 300 wiring methods and doesn't apply to Chapter 7 or Chapter 8 wiring methods for limited energy circuits and cables. Chapter 7 and Chapter 8 have their own requirements that indicate the type of building, occupancy, or premises wiring permitted.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 15 13:17:15 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The wiring methods recognized in this section (110,8) are not limited to Chapter 3 wiring methods.

Public Input No. 3885-NFPA 70-2023 [Section No. 110.9]

110.9 Interrupting Rating.

Equipment intended to interrupt current at fault levels shall have an interrupting rating at nominal circuit voltage at least equal to the available fault current at the line terminals of the equipment.

Equipment intended to interrupt current at other than fault levels shall have an interrupting rating at nominal circuit voltage at least equal to the current that must be interrupted.

Informational Note: Guidance for calculating fault current may be found in IEEE 3002.3-2018 - Recommended Practice for Conducting Short-Circuit Studies and Analysis of Industrial and Commercial Power Systems

Statement of Problem and Substantiation for Public Input

This is another slice of updated content from the legacy "Red Book" IEEE 141 mapped into the new IEEE 3000 Standards Collection. From the project prospectus:

"Activities related to short-circuit analysis, including design considerations for new systems, analytical studies for existing systems, as well as operational and model validation considerations for industrial and commercial power systems are addressed. Fault current calculation and device duty evaluation is included in short-circuit analysis. Accuracy of calculation results primarily relies on system modeling assumptions and methods used. The use of computer-aided analysis software with a list of desirable capabilities recommended to conduct a modern short-circuit study is emphasized. Examples of system data requirements and result analysis techniques are presented."

https://standards.ieee.org/standard/3002_3-2018.html

This is one of two possible locations where this reference will improve the NEC.

Submitter Information Verification

Submitter Full Name: Michael Anthony
Organization: Standards Michigan LLC
Affiliation: IEEE Education & Healthcare Facilities Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 09:05:56 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The methods of calculating available fault current in a circuit are not limited to the method proposed. Alternative methods are readily available.

Public Input No. 2450-NFPA 70-2023 [Section No. 110.10]

110.10 Circuit Impedance, Short-Circuit Current Ratings, and Other Characteristics.

The overcurrent protective devices, the total impedance, the equipment short-circuit current ratings, and other characteristics of the circuit to be protected shall be selected and coordinated to permit the circuit protective devices used to clear a fault to do so without extensive damage to the electrical equipment of the circuit. This fault shall be assumed to be either between two or more of the circuit conductors or between any circuit conductor and the equipment grounding conductor(s) permitted in 250.118. Listed equipment applied in accordance with their listing shall be considered to meet the requirements of this section.

Informational Note: Equipment with a short-circuit current rating identified with a specified class fuse, may be substituted with a current-limiting class fuse provided the let-through current is equal to or less than the class fuse identified. See UL 248 *Standard for Safety of Low Voltage Fuses* for let-through values of current-limiting class fuses.

Statement of Problem and Substantiation for Public Input

The short-circuit current rating is the prospective symmetrical fault current at a nominal voltage to which equipment is able to be connected without sustaining damage exceeding defined acceptance criteria. This is often based on the installation of a specified class of fuse. The substitution of that fuse with an equally or more current-limiting fuse would maintain or reduce the prospective fault current to the equipment. Therefore, the short-circuit current rating can be preserved.

UL 248 provides the current-limiting performance of different classes of current-limiting fuses, which can be used to determine if a different class of fuses can be used in lieu of the specified fuse and still provide adequate protection of the equipment. The required current-limiting performance of a current-limiting fuse is shown in UL 248 for each class of current-limiting fuse, based upon the ampere rating and level of fault current.

For instance, equipment may be marked with an SCCR based on 100A Class T fuse. Looking at UL 248, it will show that the current limiting performance of a 100A Class J fuse (600V) has the same current-limiting performance (based on I2t and Ip) as a 100A Class T (600V) fuse. So, the Class J fuse could be used in lieu of the Class T fuse and maintain the short-circuit current rating of the equipment.

This new information note provides guidance to the installer on alternate options of current-limiting fuses that could be used for protection of the equipment.

Submitter Information Verification

Submitter Full Name: Daniel Neeser
Organization: Eatons Bussmann Division
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 12:27:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The suggested Informational Note is a violation of the NEC Style Manual 2.1.10.2.

Public Input No. 3624-NFPA 70-2023 [Section No. 110.10]

110.10 ~~Circuit Impedance~~ Available Fault Current , Short-Circuit Current Ratings, and Other Characteristics. The overcurrent protective devices,

~~the total impedance, the~~

the equipment short-circuit current ratings, and other characteristics of the circuit to be protected shall be selected and coordinated with the available fault current to permit the

~~circuit~~

overcurrent protective devices used to clear a fault to do so without extensive damage to the electrical equipment of the circuit.

~~This fault shall be assumed to be either between two or more of the circuit conductors or between any circuit conductor and the equipment grounding conductor(s) permitted in 250.118 .~~

Listed equipment applied in accordance with their listing shall be considered to meet the requirements of this section.

Statement of Problem and Substantiation for Public Input

The current wording is long and confusing. This new wording improves the usability of this requirement by making it more concise while also clarifying the intent of the requirement.
The use of the defined term “available fault current” eliminates the need to include the total impedance in the requirement, as the total impedance is already considered when determining the available fault current.
By using the term “available fault current” you can also eliminate the second sentence of the existing wording, as available fault current is an NEC-defined term that covers the types of possible faults.
“Circuit protective device” is not a defined term, and should be replaced with “overcurrent protective device,” which is also used earlier in the requirement.

Submitter Information Verification

Submitter Full Name: Christy McElhinny
Organization: Eaton
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 10:10:40 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9081-NFPA 70-2024
Statement: The use of the defined term “available fault current” eliminates the need to include the total impedance in the requirement, as the total impedance is already considered when determining the available fault current. By using the term “available fault current” the second sentence of the existing wording is eliminated, as available fault current is an NEC-defined term that covers the types of possible faults.

Public Input No. 4147-NFPA 70-2023 [Section No. 110.10]

110.10 Circuit Impedance, Short-Circuit Current Ratings, and Other Characteristics.

The overcurrent protective devices, the total impedance, the equipment short-circuit current ratings, and other characteristics of the circuit to be protected shall be selected and coordinated to permit the circuit protective devices used to clear a fault to do so without extensive damage to the electrical equipment of the circuit. This fault shall be assumed to be either between two or more of the circuit conductors or between any circuit conductor and the equipment grounding conductor(s) permitted in 250.118. Listed equipment applied in accordance with their listing shall be considered to meet the requirements of this section.

Informational Note: Reliability is an essential characteristic of a power system. System groundingthrough an impedance that is now permitted in Section 250.36 will yield an early warning signal that a power delivery component is about to fail and thereby reduce the frequency of use of the secondsource. The impedance grounded system will, in most cases, permit the system to deliver power until a scheduled outage thereby reducing risk to occupants that depend upon a reliable power source. Impedance grounded systems reduce incident energy exposure by dramatically by diverting fault current through a resistor. With incident energy reduced, maintenance may be undertaken moresafely reducing the risk of more forced outages. IEEE 3003.1 (2019) Recommended Practice for the System Grounding of Industrial and Commercial Power Systems provides more information.

Statement of Problem and Substantiation for Public Input

This proposal is a revision to a tranche of proposals submitted in previous cycles to raise the visibility of system reliability as an essential characteristic of a power system. Everything we do is to assure safe and reliable power because lack of power -- the more frequent occurrence -- presents significant hazards to the public and to electricians who are put in harms way to remedy the cause of the outage. Limiting fault currents on appropriately specified insulated conductors to a level that signals a problem on the circuit and also reduces fault energy should be among general requirements listed here.

Submitter Information Verification

Submitter Full Name:	Michael Anthony
Organization:	Standards Michigan LLC
Affiliation:	IEEE Education & Healthcare Facilities Committee | IEEE Industrial Applications Society
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed Sep 06 18:49:16 EDT 2023
Committee:	NEC-P01

Committee Statement

Resolution: Per 90.2(A), this Code is not intended as a design specification. Further, per 2.1.10.1 of the NEC Style manual, if an informational note is needed to explain the text of the document, consideration shall be given to rewrite the text of the document to make the rule clear. The rule is clear. There is no need to add this information.

Public Input No. 356-NFPA 70-2023 [Section No. 110.11]

110.11 Deteriorating Agents.

Unless identified for use in the operating environment, no conductors or equipment shall be located in damp or wet locations; where exposed to gases, fumes, vapors, liquids, or other agents that have a deteriorating effect on the conductors or equipment; or where exposed to excessive temperatures.

Informational Note No. 1: See 300.6 for protection against corrosion.

Informational Note No. 2: Some cleaning and lubricating compounds can cause severe deterioration of many plastic materials used for insulating and structural applications in equipment.

Equipment not identified for outdoor use and equipment identified only for indoor use, such as “dry locations,” “indoor use only,” “damp locations,” or enclosure Types 1, 2, 5, 7, 9, 12, 12K, and/or 13, shall be protected against damage from the weather during construction.

Informational Note No. 3: See Table 110.28 for appropriate enclosure-type designations.

Informational Note No. 4: See *NFPA 5000*-2015, *Building Construction and Safety Code*, the *International Building Code (IBC)*, and the *International Residential Code for One- and Two-Family Dwellings (IRC)*, for information for minimum flood provisions.

Statement of Problem and Substantiation for Public Input

Without being supplemented with an additional NEMA rating, NEMA types 7 and 9 are not suitable for use in outdoor locations per NEMA 250. This Input would add NEMA Types 7 and 9 enclosures which are used in hazardous locations. I believe Art. 110 is the best place to put them instead of Chapter 5 as it keeps all types together.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 357-NFPA 70-2023 [Section No. 110.28]	Adds NEMA types 7 and 9
Public Input No. 357-NFPA 70-2023 [Section No. 110.28]	

Submitter Information Verification

Submitter Full Name: Paul Guidry
Organization: Fluor Corp.
Affiliation: Associated Builders and Contractors
Street Address:
City:
State:
Zip:
Submittal Date: Sun Feb 19 14:18:27 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Enclosure Types 7 & 9 can be listed to both indoor and outdoor locations. These references could create confusion when evaluating the general requirement for enclosures referenced in 110.28.

Public Input No. 138-NFPA 70-2023 [New Section after 110.12]

(D) Abandoned Wiring

Permanent wiring abandoned in place shall be tagged or otherwise identified at its termination and junction points as "Abandoned in Place" or removed from all accessible areas and insulated from contact with other live electrical wiring or devices.

Statement of Problem and Substantiation for Public Input

Add new Section 110.12(D)-

This proposed requirement is presently addressed in NFPA 1 section 11.1.2.3. It makes perfect sense to include this requirement in the NEC. Imagine if during every renovation, the contractors simply left all of the old wires and cables abandoned in place with no way for the next electrician to know which wiring was abandoned and which is not!!!!! This would eventually become a nightmare scenario and it needs to be addressed. I worked for a contractor for 27 years, during which time we rewired one particular commercial space 5 times! As tenants moved in and out, this space was transformed from a restaurant, to a store, then back to a restaurant, then it became an office, then a store again, then a different kind of store, and then back to a restaurant again. If that rate of tenant turnover continued even after I stopped working for that contractor, that would mean that commercial space was renovated at least 2 more times! That would be 7 renovations! Thankfully each time I rewired the space, I removed any abandoned wiring. But, can you image 7 renovations worth of abandoned wiring left in place???? And how much more abandoned wiring would there be in another 10, 20, or 30 years? At what point do we say enough is enough? I say right now! Right now we tell electricians and contractors to remove any abandoned wires or at least let the next electrician know what the heck the wires were for so he can decide to reuse them or rip them out himself. Otherwise there could be 50 years worth of abandoned wiring in the walls , floors, ceilings, and every other nook and cranny of the space.

Presently Sections 372.58, 374.58, 390.57, 590.3(D), 640.6(B), 645.5(G), 722.25, 760.25, 770.25, and 800.25 have requirements addressing abandoned or discontinued wiring. This requirement should be applied to all types of abandoned wiring instead of only a few select situations.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 139-NFPA 70-2023 [Section No. 110.12(C)]	abandoned wiring
Public Input No. 139-NFPA 70-2023 [Section No. 110.12(C)]	

Submitter Information Verification

Submitter Full Name: Russ Leblanc
Organization: Leblanc Consulting Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 11 15:56:21 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Adding a general requirement without removal of related abandoned wiring requirements elsewhere in the Code as described in the substantiation would create a redundant requirement. Further, 110.12 addresses installation rather than removal.

Public Input No. 1596-NFPA 70-2023 [Section No. 110.12]

110.12 ~~Mechanical Execution of Work~~ **Workmanship .**

~~Electrical equipment shall be~~ Installations covered by this *Code* shall be mechanically executed and installed in a ~~professional and skillful manner~~ manner demonstrating a deliberate, minimum level of workmanship .

Informational Note No. 1 : See ANSI/NECA 1-~~2015~~ 2023 , *Standard for Good Workmanship in Electrical Construction,* and other ANSI-approved installation standards for information on accepted industry practices related to quality, performance, and workmanship .

Informational Note No. 2: See definition of *Workmanship* in Article 100.

(A) Unused Openings.

Unused openings, other than those intended for the operation of equipment, those intended for mounting purposes, or those permitted as part of the design for listed equipment, shall be closed to afford protection substantially equivalent to the wall of the equipment. Where metallic plugs or plates are used with nonmetallic enclosures, they shall be recessed at least 6 mm (¼ in.) from the outer surface of the enclosure.

(B) Integrity of Electrical Equipment and Connections.

Internal parts of electrical equipment, including busbars, wiring terminals, insulators, and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners, abrasives, or corrosive residues. There shall be no damaged parts that may adversely affect safe operation or mechanical strength of the equipment such as parts that are broken; bent; cut; or deteriorated by corrosion, chemical action, or overheating.

(C) Cables and Conductors.

Cables and conductors installed exposed on the surfaces of ceilings and sidewalls shall be supported by the building structure in such a manner that the cables and conductors will not be damaged by normal building use. Such cables and conductors shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties.

Informational Note No. 1: See NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 4.3.11.2.6.5 and 4.3.11.5.5.6, for discrete combustible components installed in accordance with 300.22(C).

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

Statement of Problem and Substantiation for Public Input

During the 2023 revision cycle the word “Workmanlike” was remove and replaced with the text “Professional and Skillful” these words pertain to character traits, not to the quality of an installation. Thus, making Section 110.12 more subjective and difficult to enforce.

Workmanship is an egalitarian term, that focuses on evaluating the craftsmanship of any individual or group, the overall standard of work, precision, and dedication put forth in achieving a desirable outcome regardless of gender.

This new wording once again establishes a minimum expected level of installation quality as a state, instead of the unenforceable personal traits of the installer. It establishes the expectation is that the installation will be installed in a manner befitting that of a skilled tradesperson.

Also need to revise informational note referencing NECA 1-2023, Standard for Good Workmanship in Electrical Construction, and other ANSI-approved installation standards for information on accepted industry practices.

Finally, adding a second informational note referencing the new proposed(through companion PI) definition of "Workmanship"

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work Surface.]	
Public Input No. 1630-NFPA 70-2023 [Section No. 393.14]	

Public Input No. 1632-NFPA 70-2023 [New Section after 393.21]
Public Input No. 1668-NFPA 70-2023 [Section No. 600.24]
Public Input No. 1669-NFPA 70-2023 [New Section after 600.24]
Public Input No. 1687-NFPA 70-2023 [Section No. 722.24]
Public Input No. 1691-NFPA 70-2023 [Section No. 724.24]
Public Input No. 1692-NFPA 70-2023 [New Section after 724.21]
Public Input No. 1696-NFPA 70-2023 [New Section after 725.21]
Public Input No. 1697-NFPA 70-2023 [Section No. 725.24]
Public Input No. 1699-NFPA 70-2023 [New Section after 726.12]
Public Input No. 1700-NFPA 70-2023 [Section No. 726.24]
Public Input No. 1702-NFPA 70-2023 [Section No. 760.24]
Public Input No. 1707-NFPA 70-2023 [Section No. 770.24]
Public Input No. 1709-NFPA 70-2023 [Section No. 800.24]
Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)]
Public Input No. 1571-NFPA 70-2023 [New Definition after Definition: Work Surface.]
Public Input No. 1630-NFPA 70-2023 [Section No. 393.14]
Public Input No. 1632-NFPA 70-2023 [New Section after 393.21]
Public Input No. 1668-NFPA 70-2023 [Section No. 600.24]
Public Input No. 1669-NFPA 70-2023 [New Section after 600.24]
Public Input No. 1670-NFPA 70-2023 [Section No. 600.33(B)]
Public Input No. 1687-NFPA 70-2023 [Section No. 722.24]
Public Input No. 1692-NFPA 70-2023 [New Section after 724.21]
Public Input No. 1696-NFPA 70-2023 [New Section after 725.21]
Public Input No. 1697-NFPA 70-2023 [Section No. 725.24]
Public Input No. 1699-NFPA 70-2023 [New Section after 726.12]
Public Input No. 1700-NFPA 70-2023 [Section No. 726.24]
Public Input No. 1702-NFPA 70-2023 [Section No. 760.24]
Public Input No. 1707-NFPA 70-2023 [Section No. 770.24]
Public Input No. 1709-NFPA 70-2023 [Section No. 800.24]

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 27 08:56:36 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9087-NFPA 70-2024
Statement: The reference to NECA 1 was updated to 2023.

The current language in this section is clear and understandable and complies with the NEC Style Manual.

Public Input No. 3188-NFPA 70-2023 [Section No. 110.12(B)]

(B) Integrity of Electrical Equipment and Connections.

Internal parts of electrical equipment, including busbars, wiring terminals, insulators, and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners, abrasives, or corrosive residues, *or influences by fire, products of combustion, or water and consequences due to water saturation* . There shall be no damaged parts that may adversely affect safe operation or mechanical strength of the equipment such as parts that are broken; bent; cut; or deteriorated by corrosion, chemical action, or overheating.

Statement of Problem and Substantiation for Public Input

There are conflicts that occur when equipment and devices are not directly involved with a fire event. There are locations that could be impacted outside of the involved areas that become points of contention or are in question. this language will provide support to AHJ's concerns of the outlier areas.

Submitter Information Verification

Submitter Full Name: James Hathorn
Organization: City Of Irving
Affiliation: IAEI
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 30 09:55:09 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The concerns of the submitter are addressed in the existing requirement.

Public Input No. 139-NFPA 70-2023 [Section No. 110.12(C)]

(C) Cables and Conductors.

Cables and conductors installed exposed on the surfaces of ceilings and sidewalls shall be supported by the building structure in such a manner that the cables and conductors will not be damaged by normal building use. Such cables and conductors shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties.

Informational Note No. 1: See NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 4.3.11.2.6.5 and 4.3.11.5.5.6, for discrete combustible components installed in accordance with 300.22(C).

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

Informational Note No. 3: See NFPA 1-2021, *Fire Code*, 11.1.2.3 for requirements for abandoned wiring

Statement of Problem and Substantiation for Public Input

If Public Input 138 is not accepted, please add this important informational note no. 3 directing Code users to the requirements in NFPA 1 for removal of abandoned wiring.

Here is the text from NFPA 1

“Abandoned Wiring
Permanent wiring abandoned in place shall be tagged or otherwise identified at its termination and junction points as “Abandoned in Place” or removed from all accessible areas and insulated from contact with other live electrical wiring or devices.”

This proposed requirement is presently addressed in NFPA 1 section 11.1.2.3. It makes perfect sense to include this requirement in the NEC. Imagine if during every renovation, the contractors simply left all of the old wires and cables in place with no way for the next electrician to know which wiring was abandoned and which is not!!!!! This would eventually become a nightmare scenario and it needs to be addressed. I worked for a contractor for 27 years, during which time we rewired one particular commercial space 5 times! As tenant moved in and out, this space was transformed from a restaurant, to a store, then back to a restaurant, then it became an office, then a store again, then a different kind of store, and then back to a restaurant again. If that rate of tenant turnover continued after I stopped working for that contractor, that would mean that commercial space was renovated at least 2 more times! That would be 7 renovations! Thankfully each time I rewired the space, I removed any abandoned wiring. But, can you image 7 renovations worth of abandoned wiring? And how much more abandoned wiring would there be in another 10, 20, or 30 years? At what point do we say enough is enough? I say right now! Right now we tell electricians and contractors to remove any abandoned wires or at least let the next electrician know what the heck the wires were for so he can decide to reuse them or rip them out himself. Otherwise there could be 50 years worth of abandoned wiring in the walls , floors, ceilings, and every other nook and cranny of the space.

Presently Sections 372.58, 374.58, 390.57, 590.3(D), 640.6(B), 645.5(G), 722.25, 760.25, 770.25, and 800.25 have requirements addressing abandoned or discontinued wiring. This requirement should be applied to all types of abandoned wiring instead of only a few select situations.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 138-NFPA 70-2023 [New Section after 110.12]	abandoned wiring
Public Input No. 138-NFPA 70-2023 [New Section after 110.12]	

Submitter Information Verification

Submitter Full Name: Russ Leblanc
Organization: Leblanc Consulting Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 11 16:12:47 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Adding a general requirement without removal of related abandoned wiring requirements elsewhere in the Code as described in the substantiation would create a redundant requirement. Further, 110.12 addresses installation rather than removal.

Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]

(C) Cables and Conductors.

Cables and conductors installed exposed on the surfaces of ceilings and sidewalls shall be supported by the building structure in such a manner that the cables and conductors will not be damaged by normal building use. Such cables and conductors shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 and 300.11. Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties.

Informational Note No. 1: See NFPA 90A ~~-2021~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, ~~4.3.11.2.6.5 and 4.3.11.5.5.~~ 8.5.5. 6, for listing requirements for discrete combustible components installed in accordance with 300.22(C).

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

Statement of Problem and Substantiation for Public Input

The edition date for NFPA 90A has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states “Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard.”

The requirements for discrete products in 4.3.11.2.6.5 in NFPA 90A-2021 will be moved to 8.5.5.6 in the next (2024) edition of NFPA 90A.

Informational Note No. 2 refers to optical fiber cables only, but it applies to all cables.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]	Revise NFPA 90A reference
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]	Revise NFPA 90A reference
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]	Revise NFPA 90A reference
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]	Revise NFPA 90A reference
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]	Revise NFPA 90A reference
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]	Revise NFPA 90A reference
Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]	Revise NFPA 90A reference
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]	Revise NFPA 90A reference
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]	Revise NFPA 90A reference
Public Input No. 26-NFPA 70-2023 [Section No. 800.170]	Revise NFPA 90A reference
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]	Revise NFPA 90A reference
Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]	
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]	
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]	
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]	
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]	
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]	
Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]	
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]	
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]	
Public Input No. 26-NFPA 70-2023 [Section No. 800.170]	
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]	

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
Organization: CableSafe, Inc./OFS
Affiliation: Plastics Industry Association (PLASTICS)
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 04 10:39:29 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The revision is unnecessary as the entire Subsection (C) was deleted in a different first revision.

Public Input No. 252-NFPA 70-2023 [Section No. 110.12(C)]

~~(C) Cables and Conductors.~~

~~Cables and conductors installed exposed on the surfaces of ceilings and sidewalls shall be supported by the building structure in such a manner that the cables and conductors will not be damaged by normal building use. Such cables and conductors shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform with 300.4 and 300.11 . Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties.~~

~~Informational Note No. 1: See NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , 4.3.11.2.6.5 and 4.3.11.5.5.6, for discrete combustible components installed in accordance with 300.22(C) .~~

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

Statement of Problem and Substantiation for Public Input

This subsection was added in 2020 as part of a global effort to move repetitive requirements of Chapters 7 and 8 into the general requirements of Chapters 1-4. That effort failed, yet this section was still added. The intended target of this language was cables for limited energy circuits, as evidenced by the informational note that discusses optical fiber cables. Because this language in in Article 110, it applies to EVERY cable in the NEC, not just limited energy cables. This section points to sections 300.4 and 300.11, but ignores the far more important requirements of Article 300 like 300.10. Does that mean MC cable only needs to follow 300.4 and 300.11, and the rest of the article can be ignored? Of course not...but that isn't what this rule insinuates. The fact is, 110.12(C) should have been rejected in 2020 when the companion PIs that went along with it were resolved. We are now left with an incomplete provision that adds NOTHING to the NEC.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 31 13:52:19 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9093-NFPA 70-2024
Statement: The removal of Sub-Section (C) and the related informational notes eliminates repetitive requirements throughout the Code.

Public Input No. 1942-NFPA 70-2023 [Section No. 110.12 [Excluding any Sub-Sections]]

~~Electrical equipment shall be installed in a professional and skillful manner.~~ The workmanship associated with the installation of electrical conductors and equipment covered by this code shall be approved and shall comply with 110.12(A) through (C).

Informational Note: See ANSI/NECA 1-2015, *Standard for Good Workmanship in Electrical Construction,* and other ANSI-approved installation standards for information on accepted industry practices.

Statement of Problem and Substantiation for Public Input

Mechanical execution of work is an important general requirement. Installations installed in a professional and skillful manor are subjective and cause confusion. This revision removes the subjective language and provides the intent of the rule.

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: David Hittinger
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 07 20:41:28 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current language in this section is clear and understandable and complies with the NEC Style Manual on terms to be avoided.

Public Input No. 3220-NFPA 70-2023 [Section No. 110.13(B)]

(B) Cooling.

(1) Natural Circulation of Air. Electrical equipment that depends on the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room airflow over such surfaces is not prevented by walls or by adjacent installed equipment.

(2) Floor Mounted Equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air.

(3) Ventilating Openings. Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

Statement of Problem and Substantiation for Public Input

Breaking up 110.13(B) into a list item format to facilitate understanding for Code users. In accordance with NFPA Style Manual section 3.5.1.2 additional subdivisions shall be used where multiple requirements can be broken into independent requirements.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 30 11:52:48 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current language and structure are clear and understandable regarding ventilation around equipment

Public Input No. 4115-NFPA 70-2023 [Section No. 110.14]

110.14 Electrical Connections.

~~Because of different characteristics of dissimilar metals, devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors unless the device is identified for~~ Terminals and wire connectors shall be listed or be part of listed equipment.

(A) Conductors of Different Metals.

Conductors of different metals shall not be intermixed where physical contact occurs between conductors of different metals, unless the device is listed for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment.

Connectors and terminals for conductors more finely stranded than Class B and Class C stranding as shown in Chapter 9, Table 10, shall be identified for the specific conductor class or classes.

(~~A~~ B) Terminals.

Connection of conductors to terminal parts shall ensure a mechanically secure electrical ~~connection without damaging the conductors and~~ connection and shall be made by means of pressure connectors ~~(including set-screw type)~~, solder lugs, or splices to flexible leads. Connection by means of wire-binding screws or studs and nuts that have upturned lugs or the equivalent shall be permitted for 10 AWG or smaller conductors.

Terminals for more than one conductor and terminals used to connect aluminum shall be so identified.

(~~B~~ C) Splices.

Conductors shall be spliced ~~or joined~~ with ~~splicing devices identified for the use or~~ a listed splicing device or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be ~~spliced or joined so as to be~~ mechanically and electrically secure without solder and then be soldered. All ~~splices and joints and~~ splices and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with ~~an identified insulating~~ a listed insulating device.

Wire connectors or splicing means installed on conductors for direct burial shall be listed for such use.

~~(C~~

Informational Note No. 1: For more information on splicing and wire connectors, see UL 486A-486B, *Standard for Wire Connectors.*

Informational Note No. 2: See Annex L, Table 1 *Conductor Material and Marking for Listed Wire Connectors and Terminals.*

(D) Temperature Limitations.

The temperature rating associated with the ampacity of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor, or device. Conductors with temperature ratings higher than specified for terminations shall be permitted to be used for ampacity adjustment, correction, or both.

(1) Equipment Provisions.

The determination of termination provisions of equipment shall be based on 110.14(C)(1)(a) or (C)(1)(b). Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table 310.16 as appropriately modified by 310.12.

(a) Termination provisions of equipment for circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, shall be used only for one of the following:

(2) Conductors rated 60°C (140°F).

(3) Conductors with higher temperature ratings, provided the ampacity of such conductors is determined based on the 60°C (140°F) ampacity of the conductor size used.

(4) Conductors with higher temperature ratings if the equipment is listed and identified for use with such conductors.

(5) For motors marked with design letters B, C, or D, conductors having an insulation rating of 75°C (167°F) or higher shall be permitted to be used, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity.

(f) Termination provisions of equipment for circuits rated over 100 amperes, or marked for conductors larger than 1 AWG, shall be used only for one of the following:

(7) Conductors rated 75°C (167°F)

(8) Conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

(2) Separate Connector Provisions.

Separately installed pressure connectors shall be used with conductors at the ampacities not exceeding the ampacity at the listed and identified temperature rating of the connector.

Informational Note: Equipment markings or listing information may additionally restrict the sizing and temperature ratings of connected conductors.

(~~D~~ E) Terminal Connection Torque.

Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value.

Informational Note No. 1: Examples of approved means of achieving the indicated torque values include torque tools or devices such as shear bolts or breakaway-style devices with visual indicators that demonstrate that the proper torque has been applied.

Informational Note No. 2: See UL Standard 486A-486B, *Standard for Safety-Wire Connectors*, Informative Annex I for torque values in the absence of manufacturer's recommendations.The equipment manufacturer can be contacted if numeric torque values are not indicated on the equipment or if the installation instructions are not available.

Informational Note No. 3: See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, Section 8.11 for additional information for torquing threaded connections and terminations.

Statement of Problem and Substantiation for Public Input

The need for listed wire connectors and splicing devices is long overdue. With the the NEC now permitting the use of 10A OCPD and branch-circuits, the use of copper-clad-aluminum wire is going to continue to expand. Requiring listing will help to ensure the proper connectors, terminals and splicing devices are used where a different metal coductors are spliced. Additionally, the requirement for listing will be relation require these connectors, terminals, and devices to marked for the materials they are rated for. This is submitted in conjuntion with a PI adding a new ANNEX L which provides a Table of conductor material markings.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4125-NFPA 70-2023 [New Definition after Definition:]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger

Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 17:03:00 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: A general listing of terminations is not appropriate, as a range of terminations are unlisted. All equipment with terminations do not always have a listing requirement. The submitter has not substantiated that “the need for listed wire connectors and splicing devices is long overdue.”

Public Input No. 1342-NFPA 70-2023 [Section No. 110.14(C)]

(C) Temperature Limitations.

The temperature rating associated with the ampacity of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor, or device. Conductors with temperature ratings higher than specified for terminations shall be permitted to be used for ampacity adjustment, correction, or both.

(1) Equipment Provisions.

The determination of termination provisions of equipment shall be based on~~110~~ *110 .14(C)(1)(a) or (C)(1)(b)* . Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based ~~on Table 310.16~~ on Table 110.14(C)(1) as appropriately modified ~~by 310~~ by 310 .12 .

(a) Termination provisions of equipment for circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, shall be used only for one of the following:

(2) Conductors rated 60°C (140°F).

(3) Conductors with higher temperature ratings, provided the ampacity of such conductors is determined based on the 60°C (140°F) ampacity of the conductor size used.

(4) Conductors with higher temperature ratings if the equipment is listed and identified for use with such conductors.

(5) For motors marked with design letters B, C, or D, conductors having an insulation rating of 75°C (167°F) or higher shall be permitted to be used, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity.

(f) Termination provisions of equipment for circuits rated over 100 amperes, or marked for conductors larger than 1 AWG, shall be used only for one of the following:

(7) Conductors rated 75°C (167°F)

(8) Conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

(2) Separate Connector Provisions.

Separately installed pressure connectors shall be used with conductors at the ampacities not exceeding the ampacity at the listed and identified temperature rating of the connector.

Informational Note: Equipment markings or listing information may additionally restrict the sizing and temperature ratings of connected conductors.

Table 110.14(C)(1)

Maximum equipment termination current ratings

Size AWG or kcmil	60°C (140°F) COPPER	75°C (167°F)	90°C (194°F)	60°C (140°F) ALUMINUM C
18	-	-	14	-
16	-	-	18	-
14	15 *	20	25	-
12	20 *	25	30	15 *
10	30 *	35	40	25 *
8	40 *	50	55	35 *
6	55 *	65	75	40 *
4	70 *	85	95	55 *
3	85 *	100	115	65 *
2	95 *	115	130	75 *
1	110 *	130	145	85 *
1/0		150 *	170	
2/0		175 *	195	
3/0		200 *	225	
4/0		230 *	260	
250		255 *	290	
300		285 *	320	
350		310 *	350	
400		335 *	380	
500		380 *	430	
600		420 *	475	
700		460 *	520	
750		475 *	535	
800		490 *	555	
900		520 *	585	
1000		545 *	615	
1250		590 *	665	
1500		625 *	705	
1750		650 *	735	
2000		665 *	750	

*	Default maximum permitted amps per 110.14(C)(1) when temperature rating of terminal is not k
**	*Minimum ampacity when the temperature rating of the equipment termination is not known. Re*

Additional Proposed Changes

File Name	Description	Approved
110.14_PublicInputLanguage.docx	This document shows the proposed changes in track changes for clarity. It seems Terra has decided to indicate changes that are not occurring. To avoid the confusion, please see the attached document.	

Statement of Problem and Substantiation for Public Input

Table 310.15(B)(16) has historically been used for two separate functions.
Table 310.15(B)(16) is used as the starting point for determining ampacity of a conductor when adjustments or correction factors are applied to address conditions of use which include ambient temperature and number of conductors in a raceway.
Table 310.15(B)(16) has also been used to identify the limitations placed on the conductor when terminating in equipment.
The intent of this PI is to separate these two functions

Submitter Information Verification

Submitter Full Name: Thomas Domitrovich
Organization: Eaton Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jul 08 16:44:13 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current language is clear about terminations equipment and the temperature limitation of the terminals and conductors.

110.14 Electrical Connections.

Because of different characteristics of dissimilar metals, devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment.

Connectors and terminals for conductors more finely stranded than Class B and Class C stranding as shown in Chapter 9, Table 10, shall be identified for the specific conductor class or classes.

(A) Terminals.

Connection of conductors to terminal parts shall ensure a mechanically secure electrical connection without damaging the conductors and shall be made by means of pressure connectors (including set-screw type), solder lugs, or splices to flexible leads. Connection by means of wire-binding screws or studs and nuts that have upturned lugs or the equivalent shall be permitted for 10 AWG or smaller conductors.

Terminals for more than one conductor and terminals used to connect aluminum shall be so identified.

(B) Splices.

Conductors shall be spliced or joined with splicing devices identified for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be spliced or joined so as to be mechanically and electrically secure without solder and then be soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an identified insulating device.

Wire connectors or splicing means installed on conductors for direct burial shall be listed for such use.

(C) Temperature Limitations.

The temperature rating associated with the ampacity of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor, or device. Conductors with temperature ratings higher than specified for terminations shall be permitted to be used for ampacity adjustment, correction, or both.

(1) Equipment Provisions.
The determination of termination provisions of equipment shall be based on 110.14(C)(1)(a) or (C)(1)(b). Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table 110.14(C)(1)~~310.16~~ as appropriately modified by 310.12.

(a) Termination provisions of equipment for circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, shall be used only for one of the following:

(1) Conductors rated 60°C (140°F).
(2) Conductors with higher temperature ratings, provided the ampacity of such conductors is determined based on the 60°C (140°F) ampacity of the conductor size used.
(3) Conductors with higher temperature ratings if the equipment is listed and identified for use with such conductors.
(4) For motors marked with design letters B, C, or D, conductors having an insulation rating of 75°C (167°F) or higher shall be permitted to be used, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity.

(b) Termination provisions of equipment for circuits rated over 100 amperes, or marked for conductors larger than 1 AWG, shall be used only for one of the following:

(1) Conductors rated 75°C (167°F)

(2) Conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

(2) Separate Connector Provisions.
Separately installed pressure connectors shall be used with conductors at the ampacities not exceeding the ampacity at the listed and identified temperature rating of the connector.

Informational Note: Equipment markings or listing information may additionally restrict the sizing and temperature ratings of connected conductors.

(D) Terminal Connection Torque.
Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value.

Informational Note No. 1: Examples of approved means of achieving the indicated torque values include torque tools or devices such as shear bolts or breakaway-style devices with visual indicators that demonstrate that the proper torque has been applied.

Informational Note No. 2: See UL Standard 486A-486B, Standard for Safety-Wire Connectors, Informative Annex I for torque values in the absence of manufacturer's recommendations.The equipment manufacturer can be contacted if numeric torque values are not indicated on the equipment or if the installation instructions are not available.

Informational Note No. 3: See NFPA 70B-2019, Recommended Practice for Electrical Equipment Maintenance, Section 8.11 for additional information for torquing threaded connections and terminations.

Table 110.14(C)(1)

Maximum equipment termination current ratings

Size AWG or kcmil	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	Size AWG or kcmil
	COPPER			ALUMINUM OR COPPER-CLAD ALUMINUM			
18	-	-	14	-	-	-	-
16	-	-	18	-	-	-	-
14	15 *	20	25	-	-	-	-
12	20 *	25	30	15 *	20	25	12
10	30 *	35	40	25 *	30	35	10
8	40 *	50	55	35 *	40	45	8
6	55 *	65	75	40 *	50	55	6
4	70 *	85	95	55 *	65	75	4
3	85 *	100	115	65 *	75	85	3
2	95 *	115	130	75 *	90	100	2
1	110 *	130	145	85 *	100	115	1
1/0	-	150 *	170	-	120 **	135	1/0
2/0	-	175 *	195	-	135 **	150	2/0
3/0	-	200 *	225	-	155 **	175	3/0
4/0	-	230 *	260	-	180 **	205	4/0
250	-	255 *	290	-	205 **	230	250
300	-	285 *	320	-	230 **	260	300
350	-	310 *	350	-	250 **	280	350
400	-	335 *	380	-	270 **	305	400
500	-	380 *	430	-	310 **	350	500
600	-	420 *	475	-	340 **	385	600
700	-	460 *	520	-	375 **	425	700
750	-	475 *	535	-	385 **	435	750
800	-	490 *	555	-	395 **	445	800
900	-	520 *	585	-	425 **	480	900
1000	-	545 *	615	-	445 **	500	1000
1250	-	590 *	665	-	485 **	545	1250
1500	-	625 *	705	-	520 **	585	1500
1750	-	650 *	735	-	545 **	615	1750
2000	-	665 *	750	-	560 **	630	2000

* – Default maximum permitted amps per 110.14(C)(1) when temperature rating of terminal is not known

**	Minimum ampacity when the temperature rating of the equipment termination is not known. Reference 110.14(C)(1)(b)

Public Input No. 382-NFPA 70-2023 [Section No. 110.14(C)(1)]

(1) Equipment Provisions.

The determination of termination provisions of equipment shall be based on 110.14(C)(1)(a) or (C)(1)(b). Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table 310.16 as appropriately modified by 310.12.

(a) Termination provisions of equipment for circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, shall be used only for one of the following:

(2) Conductors rated 60°C (140°F).

(3) Conductors with higher temperature ratings, provided the ampacity of such conductors is determined based on the 60°C (140°F) ampacity of the conductor size used.

~~Conductors with higher temperature ratings~~

(1) For listed equipment having terminals identified for use with 75°C (167°F) rated conductors, 75°C (167°F) rated conductors or conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

-

(1)

(2) For motors marked with design letters B, C, or D, conductors having an insulation rating of 75°C (167°F) or higher shall be permitted to be used, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity.

(d) Termination provisions of equipment for circuits rated over 100 amperes, or marked for conductors larger than 1 AWG, shall be used only for one of the following:

(5) Conductors rated 75°C (167°F)

(6) Conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

Additional Proposed Changes

File Name	Description	Approved
110.14_C_1_a_4_.1673019050484.docx	equipment with 75 degree terminals	

Statement of Problem and Substantiation for Public Input

Terraview keeps renumbering the sections.

please revise item 3

Using higher rated conductors with their ampacity based on the 75 degree C ampacity should also be permitted for equipment other than motors.

Here are the present options for equipment terminations.

Section 110.14(C)(1)(a)(1) requires 60 degree C conductors..

Section 110.14(C)(1)(a)(2) permits 75 degree C or 90 degree C conductors with their ampacity determined at the 60 degree C ampacity.

Section 110.14(C)(1)(a)(3) permits 75 degree C conductors to be used on equipment listed for use with 75 degree C conductors. It does not however specifically permit 90 degree C conductors to be used on equipment listed for use with

75 degree C conductors. The intent may be to allow it, but it falls short of that. If the intent is to allow 90 degree C conductors it then fails to specify how to determine the ampacity of the 90 degree C conductor on 75 degree C terminal. My proposed revisions clarify this issue.

Section 110.14(C)(1)(a)(4) presently only applies to motors, but does not apply to receptacles, switches, circuit breakers or other equipment! It should, if the equipment is listed and identified for use with 75 degree C conductors. This same provision should also be permitted for equipment other than motors.

While the last Sentence in 110.14(C) permits conductors with temperature ratings higher than specified for terminations, it only permits them be to be used for ampacity adjustment, correction, or both, and does not tell us how to determine the ampacity of a 90 degree wire on a 75 degree terminal. Can the 90 degree ampacity be used in this case? I don't believe that is the intent. I believe a 90 degree wire should be limited to the 75 degree ampacity in this case to avoid overheating the terminal. My proposed revisions will permit 90 degree C conductors to have their ampacty based on the 75 degree C ampacity even when no adjustments or corrections are required.

My proposed revision will also provide consitency with the wording and requirements in Section 110.14(C)(1)(b)(2)

See the photos I submitted showing a 50-amp receptacle, a 30-amp receptacle, and a circuit breaker, all of which are listed and identified for use with 75 degree C conductors. These receptacles are not listed for use with 90 degree C conductors. Using 90 degree C conductors with their ampacity based on the 75 degree C ampacity should be permitted for these receptacles and other equipment listed and identified for use with 75 degree C conductors.

Pleased see my companion PI 48 as another potential way to address this conundrum.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 48-NFPA 70-2023 [Section No. 110.14(C)(1)]	75 degree terminals
Public Input No. 48-NFPA 70-2023 [Section No. 110.14(C)(1)]	

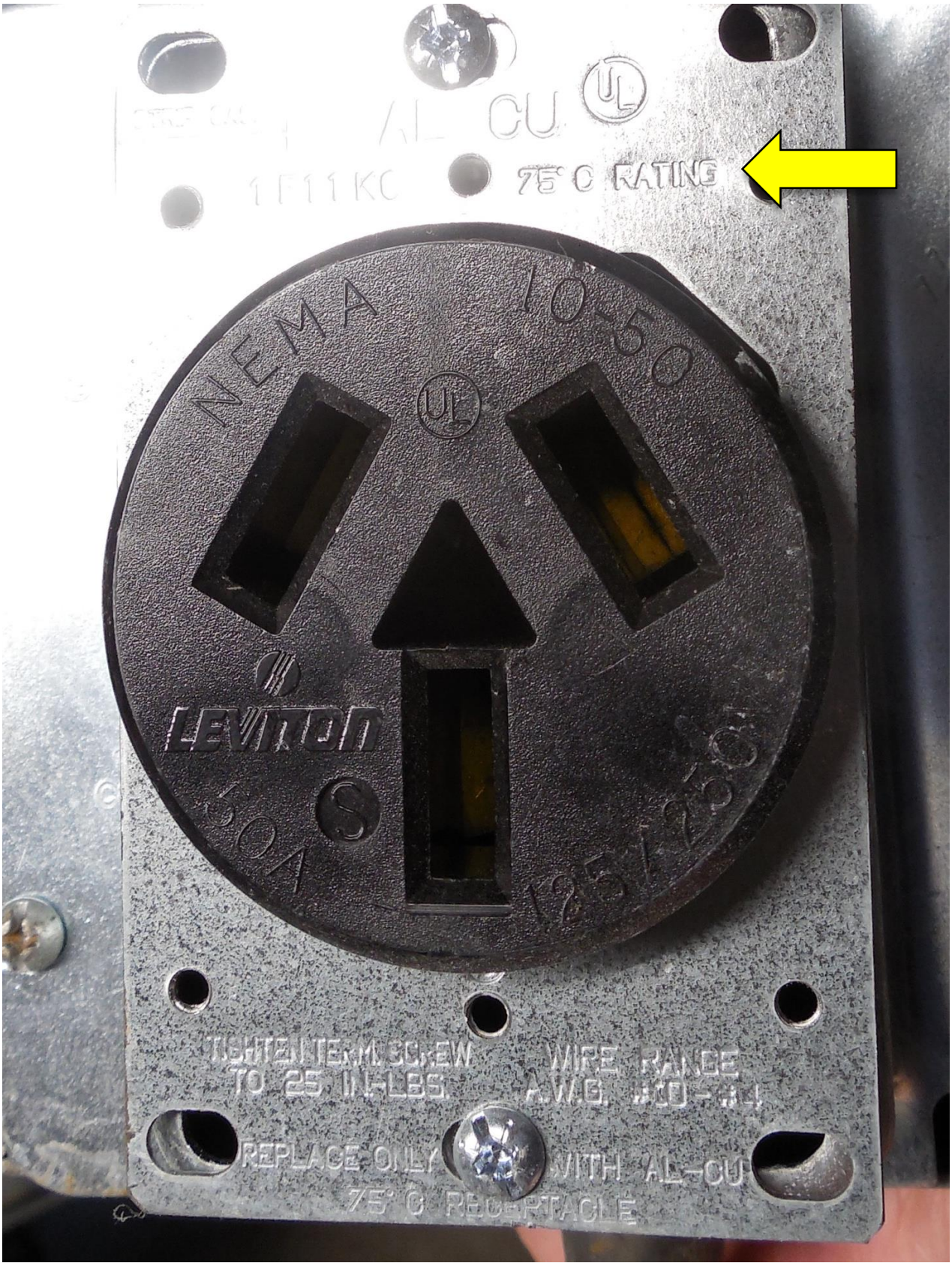
Submitter Information Verification

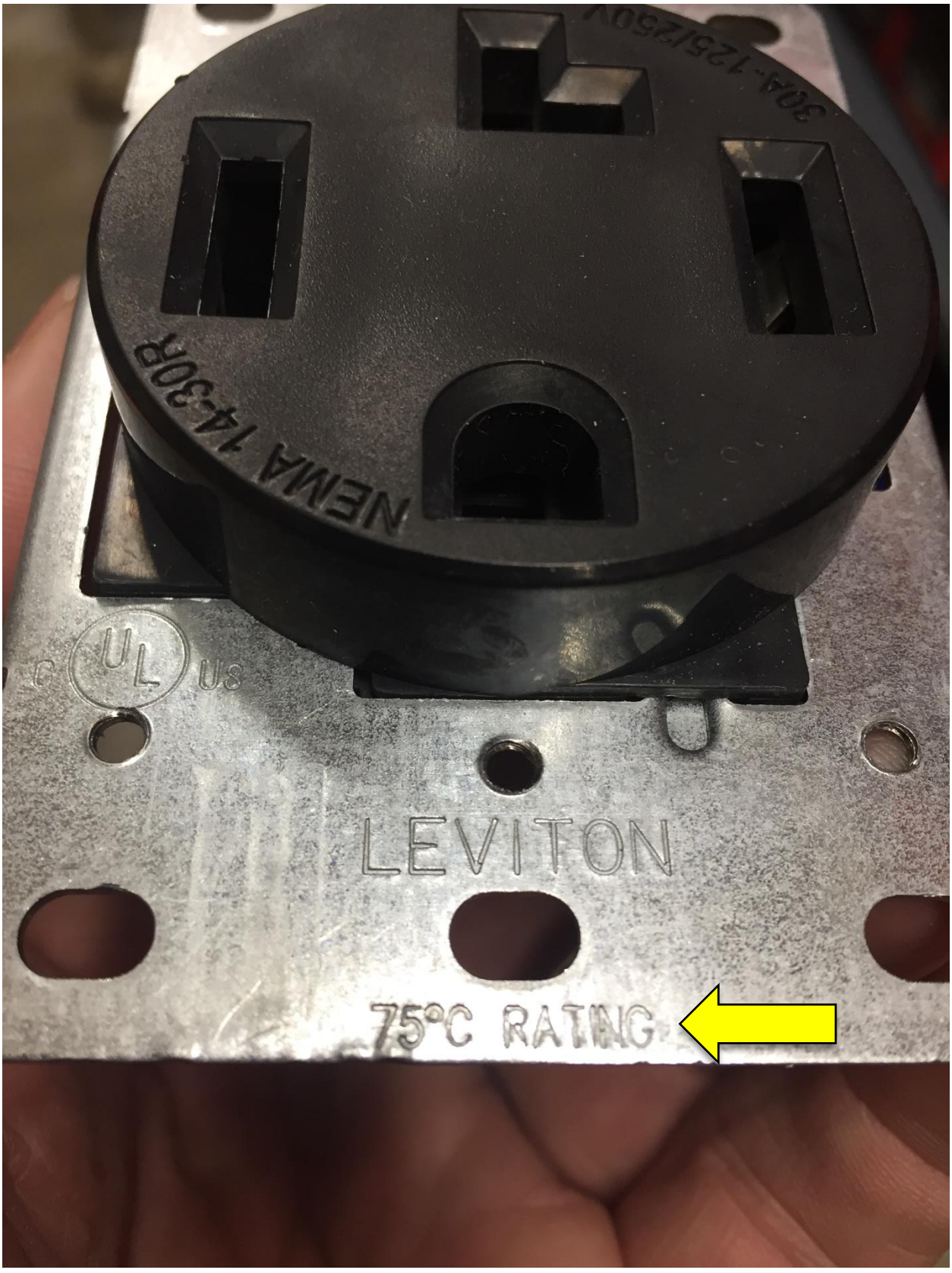
Submitter Full Name: Russ Leblanc
Organization: Leblanc Consulting Services
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 02 10:54:15 EST 2023
Committee: NEC-P01

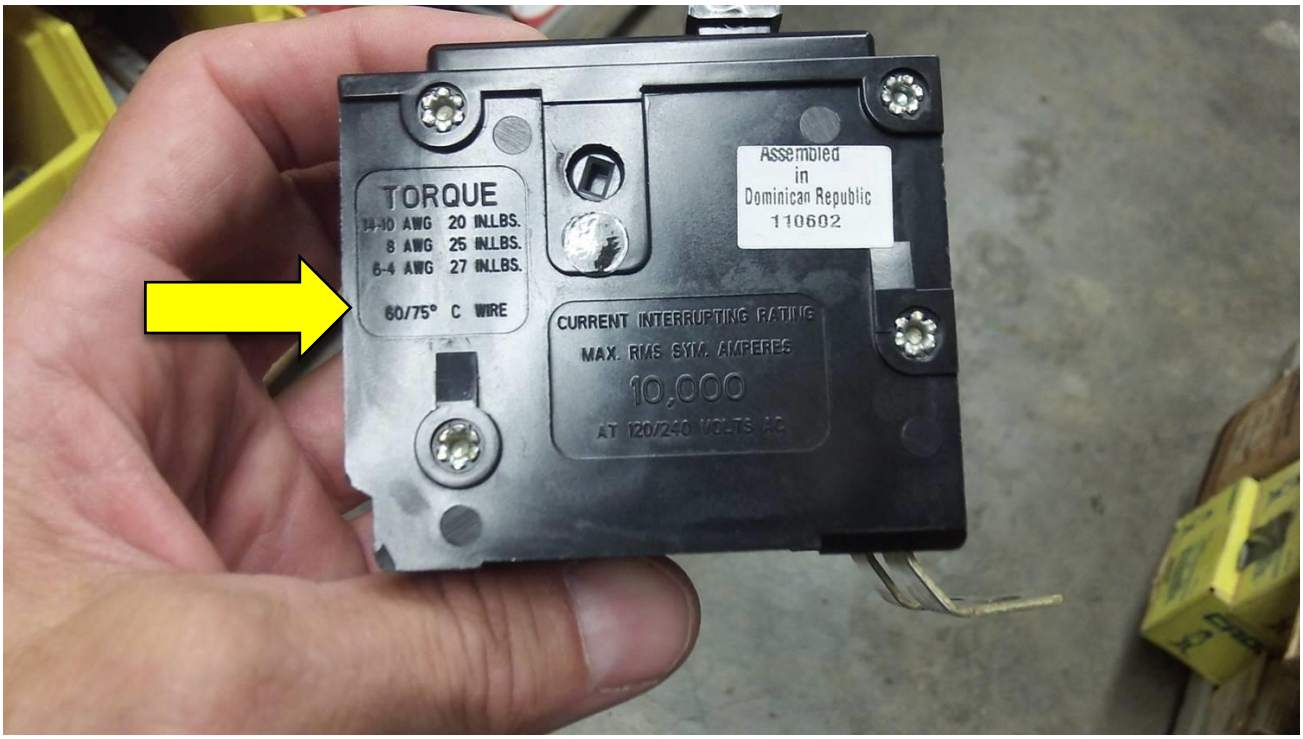
Committee Statement

Resolution: The current language is clear about terminations equipment and the temperature limitation of the terminals and conductors.

See the following photos I submitted showing a 50-amp receptacle, a 30-amp receptacle, and a circuit breaker, all of which are listed and identified for use with 75 degree C conductors. These receptacles and circuit breaker are not listed for use with 90 degree C conductors. Using 90 degree C conductors with their ampacity based on the 75 degree C ampacity should be permitted for these receptacles, breaker and other equipment listed and identified for use with 75 degree C conductors.


AL CU
75° C RATING
NEMA 10-50
LEVITON
50A
125/250V
TIGHTEN TERM. SCREW TO 25 IN-LBS.
WIRE RANGE A.W.G. #10 - #4
REPLACE ONLY WITH AL-CU 75° C RECEPTACLE


30A-125/250V
NEMA 14-30R
UL
LEVITON
75°C RATING



Russell LeBlanc

Public Input No. 449-NFPA 70-2023 [Section No. 110.14(C)(1)]

(1) Equipment Provisions.

The determination of termination provisions of equipment shall be based on 110.14(C)(1)(a) or (C)(1)(b). Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table 310.16 as appropriately modified by 310.12.

(a) Termination provisions of equipment for circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, shall be used only for one of the following:

(2) Conductors rated 60°C (140°F).

(3) Conductors with higher temperature ratings, provided the ampacity of such conductors

~~is determined based on~~

(1) does not exceed the 60°C (140°F)

~~ampacity of~~

(1) ampacity (before adjustment and correction factors) of the conductor size used.

(2) Conductors with higher temperature ratings if the equipment is listed and identified for use with such conductors.

(3) For motors marked with design letters B, C, or D, conductors having an insulation rating of 75°C (167°F) or higher shall be permitted to be used, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity.

(d) Termination provisions of equipment for circuits rated over 100 amperes, or marked for conductors larger than 1 AWG, shall be used only for one of the following:

(5) Conductors rated 75°C (167°F)

(6) Conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F)

~~ampacity~~

(1) ampacity (before adjustment and correction factors) of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

Statement of Problem and Substantiation for Public Input

This proposal consists of two changes for greater clarity and logical correctness. 110.14(C) has historically been a source of confusion for many in the electrical trades.

The first change is to 110.14(C)(1)(a)(2) to simply match the language used in 110.14(C)(1)(b)(2).

The second change is to follow the second use of the word "ampacity" in both sections with the parenthetical comment "before adjustment and correction factors." It is commonly understood that the termination temperature limitations in 110.14(C) refer to the table values from Table 310.16, without applying any adjustment and correction factors. This is shown in Example D3(a) in Annex D, in the section "Ungrounded Feeder Conductors."

However, the definition of "ampacity" refers to the "conditions of use", and 310.15 specifies that the ampacity "shall be as . . . modified by 310.15(A) through (F) . . ." So the term "ampacity" alone always properly means that adjustment and correction factors are to be applied (310.15(B) and (C)).

Thus, whenever it is desired to refer to the unadjusted and uncorrected values from Table 310.16, it is necessary to provider an appropriate modifier to the term ampacity. Therefore I suggest the modifier "before adjustment and correction factors."

Submitter Information Verification

Submitter Full Name: Wayne Whitney
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 14 11:43:27 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current language is clear about terminations equipment and the temperature limitation of the terminals and conductors.

Public Input No. 48-NFPA 70-2023 [Section No. 110.14(C)(1)]

(1) Equipment Provisions.

The determination of termination provisions of equipment shall be based on 110.14(C)(1)(a) or (C)(1)(b). Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table 310.16 as appropriately modified by 310.12.

(a) Termination provisions of equipment for circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, shall be used only for one of the following:

(2) Conductors rated 60°C (140°F).

(3) Conductors with higher temperature ratings, provided the ampacity of such conductors is determined based on the 60°C (140°F) ampacity of the conductor size used.

~~Conductors with higher temperature ratings if the equipment is listed and identified~~

(1) For listed equipment having terminals identified for use with

~~such conductors.For~~

(1) 75°C (167°F) rated conductors, and for motors marked with design letters B, C, or D, conductors having an insulation rating of 75°C (167°F) or higher shall be permitted to be used, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity.

(2) Conductors with higher temperature ratings if the equipment is listed and identified for use with such conductors.

(a) Termination provisions of equipment for circuits rated over 100 amperes, or marked for conductors larger than 1 AWG, shall be used only for one of the following:

(2) Conductors rated 75°C (167°F)

(3) Conductors with higher temperature ratings, provided the ampacity of such conductors does not exceed the 75°C (167°F) ampacity of the conductor size used, or up to their ampacity if the equipment is listed and identified for use with such conductors

Additional Proposed Changes

File Name	Description	Approved
110.14_C_1_a_4_.docx	75 degree terminals	

Statement of Problem and Substantiation for Public Input

Renumber and revise
Terraview keeps changing numbering sequence for some reason.

Revise item (4) and Renumber item (4) to (3) and item (3) to (4) to flow in a more logical manner.

Substantiation:

Using higher rated conductors with their ampacity based on the 75 degree C ampacity should also be permitted for equipment other than motors.

Here are the present options for equipment terminations.

Section 110.14(C)(1)(a)(1) requires 60 degree C conductors..

Section 110.14(C)(1)(a)(2) permits 75 degree C or 90 degree C conductors with their ampacity determined at the 60 degree C ampacity.

Section 110.14(C)(1)(a)(3) permits 75 degree C conductors to be used on equipment listed for use with 75 degree C conductors. It does not however specifically permit 90 degree C conductors to be used on equipment listed for use with 75 degree C conductors! The intent may be to allow it, but it falls short of that. If the intent is to allow 90 degree C conductors it then fails to specify how to determine the ampacity of the 90 degree C conductor on 75 degree C terminal.

Section 110.14(C)(1)(a)(4) presently only applies to motors, but does not apply to receptacles, switches, circuit breakers or other equipment! It should, if the equipment is listed and identified for use with 75 degree C conductors. This same provision should also be permitted for equipment other than motors. My proposed revisions clarify this issue.

While the last Sentence in 110.14(C) permits conductors with temperature ratings higher than specified for terminations, it only permits them be to be used for ampacity adjustment, correction, or both, and does not tell us how to determine the ampacity of a 90 degree wire on a 75 degree terminal. Can the 90 degree ampacity be used in this case? I don't believe that is the intent. I believe a 90 degree wire should be limited to the 75 degree ampacity in this case to avoid overheating the terminal. My proposed revisions will permit 90 degree C conductors to have their ampacty based on the 75 degree C ampacity even when no adjustments or corrections are required.

See the photos I submitted showing a 50-amp receptacle, a 30-amp receptacle, and a circuit breaker, all of which are listed and identified for use with 75 degree C conductors. These receptacles are not listed for use with 90 degree C conductors. Using 90 degree C conductors with their ampacity based on the 75 degree C ampacity should be permitted for these receptacles and other equipment listed and identified for use with 75 degree C conductors.

Please see my companion PI 382 as another potential way to address this conundrum.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 382-NFPA 70-2023 [Section No. 110.14(C)(1)]	75 degree terminals
Public Input No. 382-NFPA 70-2023 [Section No. 110.14(C)(1)]	

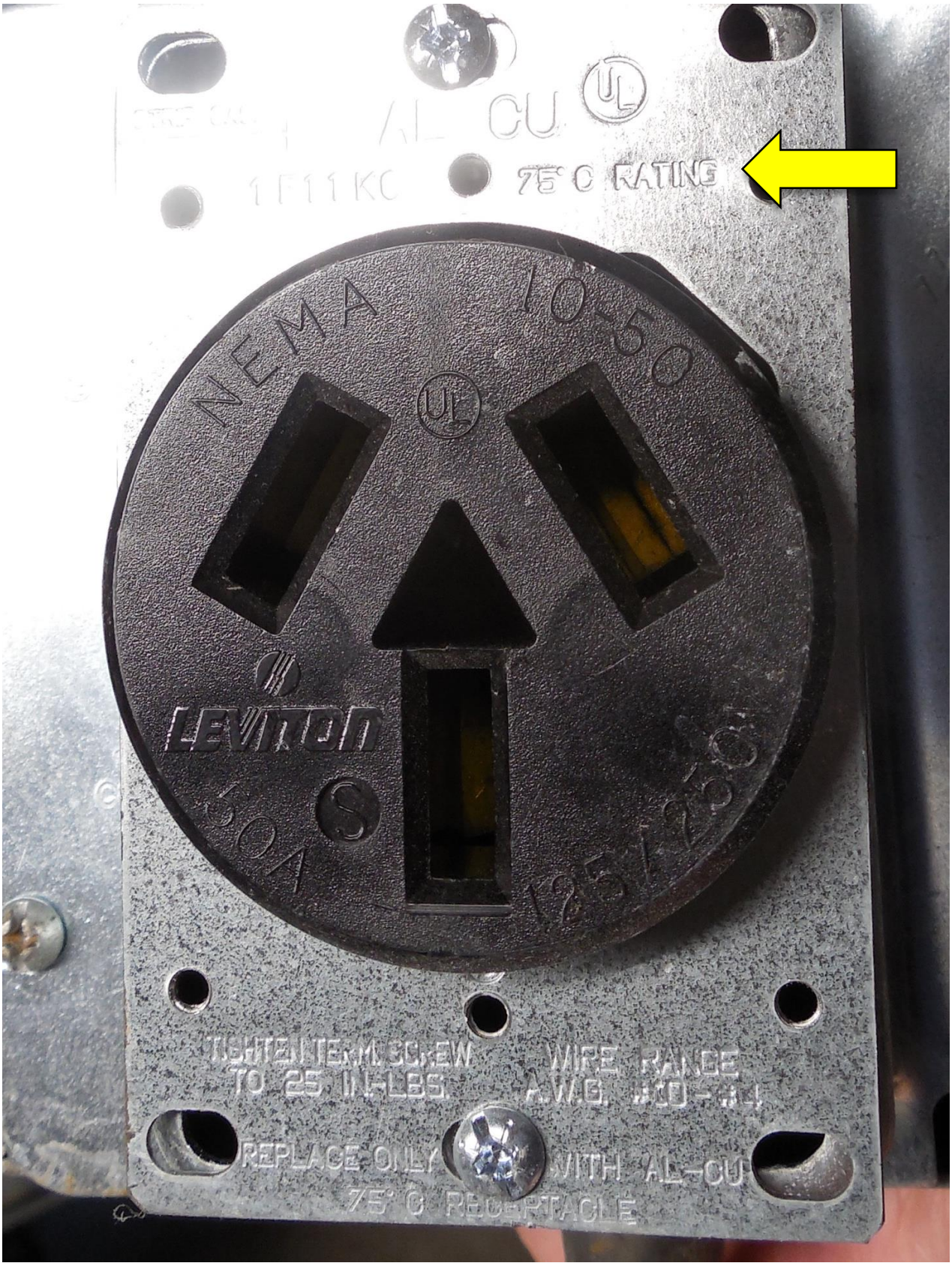
Submitter Information Verification

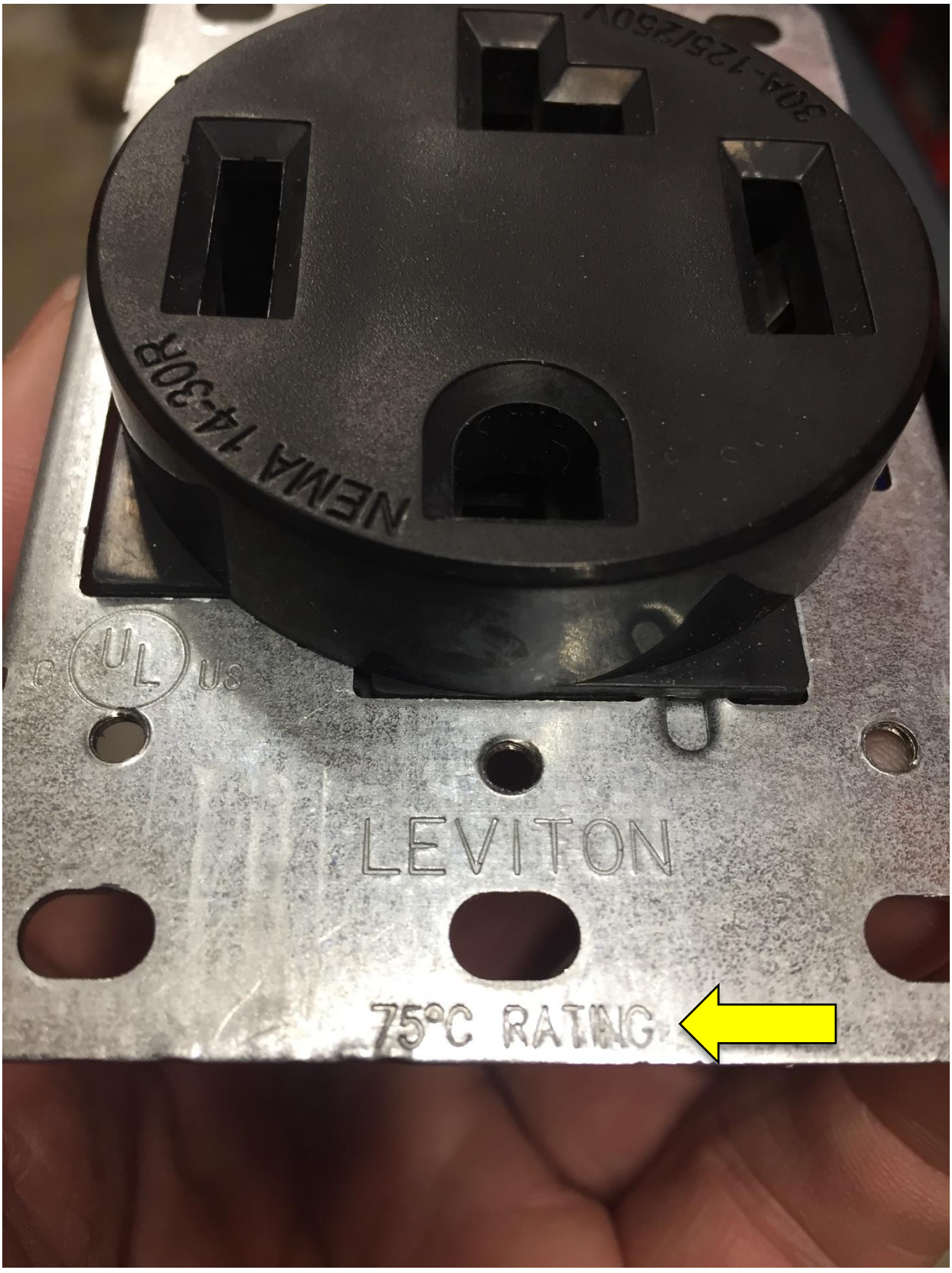
Submitter Full Name: Russ Leblanc
Organization: Leblanc Consulting Services
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 06 10:12:41 EST 2023
Committee: NEC-P01

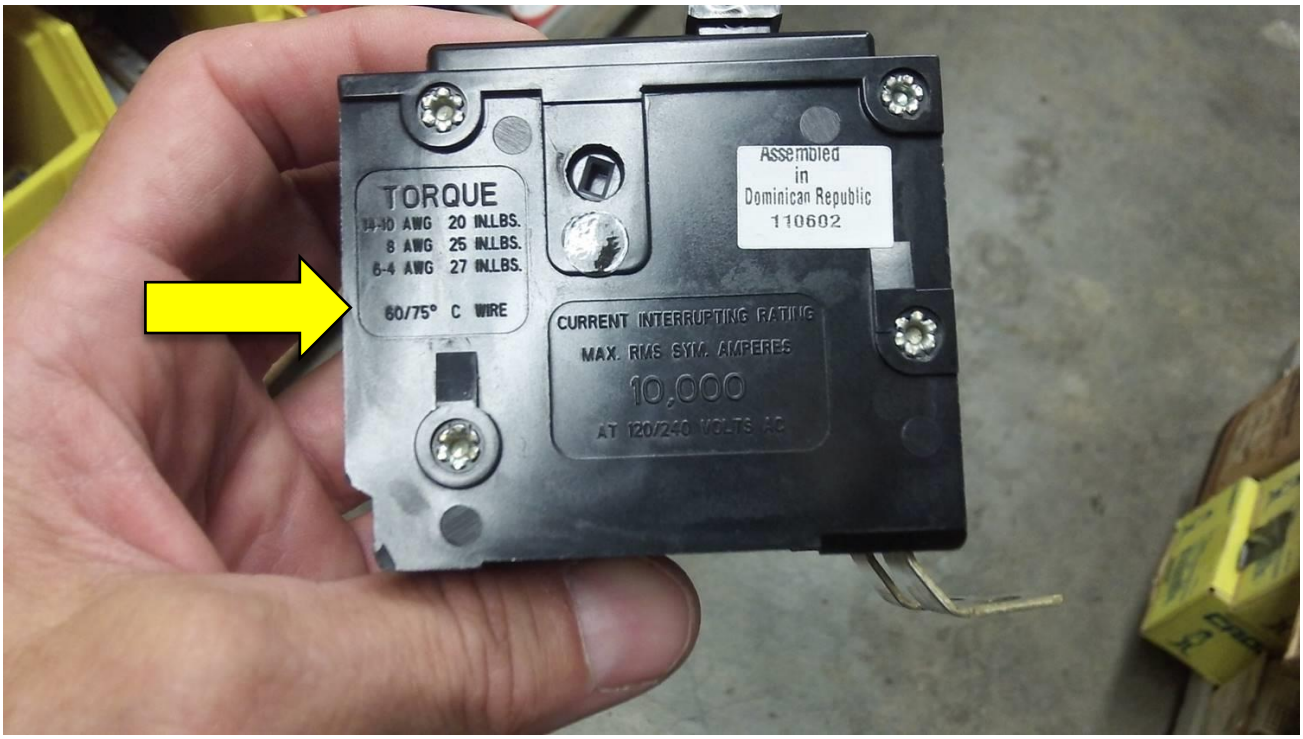
Committee Statement

Resolution: The current language is clear about terminations equipment and the temperature limitation of the terminals and conductors.

See the following photos I submitted showing a 50-amp receptacle, a 30-amp receptacle, and a circuit breaker, all of which are listed and identified for use with 75 degree C conductors. These receptacles are not listed for use with 90 degree C conductors. Using 90 degree C conductors with their ampacity based on the 75 degree C ampacity should be permitted for these receptacles and other equipment listed and identified for use with 75 degree C conductors.


AL CU
75° C RATING
NEMA 10-50
LEVITON
50A
125/250V
TIGHTEN TERM. SCREW TO 25 IN-LBS.
WIRE RANGE A.W.G. #10 - #4
REPLACE ONLY WITH AL-CU 75° C RECEPTACLE


30A-125/250V
NEMA 14-30R
UL
LEVITON
75°C RATING



Russell LeBlanc

Public Input No. 1093-NFPA 70-2023 [Section No. 110.14(D)]

(D) Terminal Connection Torque.

Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer by contacting the manufacturer, or by determining suitable torque through consulting a resource approved by the AHJ . See IN 2 for a resource that might be approved.. An approved means shall be used to achieve the indicated torque value.

Informational Note No. 1: Examples of approved means of achieving the indicated torque values include torque tools or devices such as shear bolts or breakaway-style devices with visual indicators that demonstrate that the proper torque has been applied.

Informational Note No. 2: See UL Standard 486A-486B, *Standard for Safety-Wire Connectors*, Informative Annex I for torque values in the absence of manufacturer's recommendations.The equipment manufacturer can be contacted if numeric torque values are not indicated on the equipment or if the installation instructions are not available.

Informational Note No. 3: See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, Section 8.11 for additional information for torquing threaded connections and terminations.

Statement of Problem and Substantiation for Public Input

The present language seems awkward. Most receptacles nowadays may have torque settings. Yet when they are missing, we have suggestive language rather than clear instruction. Let's try to fix this.

If my receptacle is marked "12 lb-in," that's where I need to set my torque screwdriver. If it's not marked, and the torque isn't in accompanying instructions, I probably need to look at the shaft of the wire-binding screw and check its size in Annex I, tightening torques, now that 110.14(D) explicitly requires compliance with tightening torque values for terminal connections. However, in this case the instruction to tighten it to a suitable torque rating is found in IN 2. Because INs are themselves advisory, not binding, they are not supposed to contain mandatory language.

IN2 doesn't. It says in the absence of instructions, "See" UL 486 A-B or Annex I. That looks like what we need to do.

Then it says "the manufacturer can be contacted." "Can" is not an instruction. So it seems to amend or extend 110.14(D). Still, "See" is not the same as "See and comply with," but if not, it seems unlikely that the advisory note is saying, "If there's no marking, and the manufacturer did not include instructions, here are places you can look if you feel like finding a particular value to torque the terminal"? This seems unlikely.

It is not clear whether the requirement exists at all in the case that no torque value is indicated. On the basis of the reasoning that the torque values in the UL standards are intended to maintain safety, it seems that there should be a clearer requirement. If that's not a correct reading, and when manufacturers don't mark torque settings it is safe to tighten by feel as we used to, the section should say that instead.

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 22:03:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The informative annex is for torque guidance. The AHJ already has the final approval if the product information is not available per 90.4(B).

Public Input No. 2904-NFPA 70-2023 [Section No. 110.14(D)]

(D) Terminal Connection Torque.

Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value.

Informational Note No. 1: Examples of approved means of achieving the indicated torque values include torque tools or devices such as shear bolts or breakaway-style devices with visual indicators that demonstrate that the proper torque has been applied.

Informational Note No. 2: See UL Standard 486A-486B, *Standard for Safety-Wire Connectors*, Informative Annex I for torque values in the absence of manufacturer's recommendations.The equipment manufacturer can be contacted if numeric torque values are not indicated on the equipment or if the installation instructions are not available.

Informational Note No. 3: See NFPA 70B ~~-2019~~ , ~~Recommended Practice~~ Standard for Electrical Equipment Maintenance , ~~Section 8~~ 7 ~~.11~~ 2, for additional information for torquing threaded connections and terminations.

Statement of Problem and Substantiation for Public Input

The 70B is now a Standard and not a Recommended Practice. With the revision between 2019 and the 2023, the Chapter references were changed.

Submitter Information Verification

Submitter Full Name: Roger Zieg
Organization: NTT
Street Address:
City:
State:
Zip:
Submittal Date: Sat Aug 26 10:43:01 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8929-NFPA 70-2024
Statement: The Panel reviewed the informational notes within their purview to comply with the NEC Style Manual Section 2.1.10 and the Regulations Governing the Development of NFPA Standards, Section 3.3.7.4. and made the following revisions.

Public Input No. 2411-NFPA 70-2023 [Section No. 110.14 [Excluding any Sub-Sections]]

Because of different characteristics of dissimilar metals, devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment. Electrical connections using dissimilar metals that are exposed to damp, wet, or corrosive conditions shall be environmentally sealed (as air-tight and water-tight) or otherwise protected against the effects of corrosion using hardware listed for the purpose .

Connectors and terminals for conductors more finely stranded than Class B and Class C stranding as shown in Chapter 9, Table 10, shall be identified for the specific conductor class or classes.

Additional Proposed Changes

File Name	Description	Approved
PI_2411_Attachment_C_.pdf		

Statement of Problem and Substantiation for Public Input

Secure grounding and bonding connections are essential to a safe electrical system. Grounding is essential to ensure a safe return path for electrical current. Bonding ensures that all metal parts of electrical equipment have the same electrical potential, reducing the risk of shock hazard and damage. Both grounding and bonding are necessary for an electrical system to ensure safety, reliability, and performance.
The effects of corrosion on grounding and bonding connections, especially outdoors or in humid or corrosive environments are significant. Humidity causes metals to corrode and can accelerate the galvanic action caused by using dissimilar metals used to bond electrical equipment. Corrosive atmospheres, such as in a swimming pool equipment room can quickly corrode grounding and bonding connections, rendering them unsafe.
Galvanic corrosion is an electrochemical process in which one metal corrodes preferentially when it is in electrical contact with another, in the presence of an electrolyte, such as water. By keeping the electrolyte away from the connection, corrosion can be significantly reduced.

Connections using dissimilar metals will quickly corrode when exposed to weather or corrosive conditions, causing failure of the bonding pathway. Corrosion is a major problem for electrical connections, as it can lead to increased resistance and heating. Corrosion can lead to connections becoming oxidized, creating a high resistance contact, and can ultimately lead to the failure of the connection. Poor grounding and bonding connections can result in an electrical potential on exposed metal parts, which may result in property damage, injury, or death.

Corrosion is a natural phenomenon which occurs under certain moisture, temperature and atmospheric conditions; it cannot be avoided, only mitigated. Corrosion weakens products therefore affecting their function and integrity.

Corrosion is a large problem. A 2002 study by the National Association of Corrosion Engineers, backed by the Federal Highway Administration, estimated corroding metals in various industries, infrastructure and manufacturing cost $276 billion annually.

For example, the United States Consumer Product Safety Commission (CPSC) ordered a recall of 1.3 million grounding lugs due to corrosion issues in 2014. Although no deaths were attributed to the recall, the cost to replace the lugs was significant.

In another case, a recent article illustrated significant lightning damage to Orange County Florida's public emergency communications equipment. 1 The damage was caused by lightning strikes and corrosion of bonding connections on lightning protection conductors. These damages were between one and two million dollars over a ten-year period.

According to the CPSC, approximately 90 people are electrocuted annually in the United States due to appliances or wiring issues. There are also at least 30,000 non-fatal shock incidents per year in the United States. Each year, approximately 5% of all burn unit admissions in the United States occur because of electrical injuries.

Preventing corrosion of grounding and bonding connections in wet, damp, or corrosive atmospheres can be challenging. Equipment located in these conditions are exposed to the elements, which can result in atypical situations where the usual practices for bonding may not perform as intended. For example, many listed grounding lugs are not designed to be installed outdoors; using a lug that is not rated for outdoor use can lead to premature failures in the intended path for fault current, impairing the functionality of overcurrent and ground-fault protection devices. Other issues include corrosion of

bonding connections due to galvanic action.

Grounding lugs can damage the protective anodized coating on aluminum module frames and rails. For example, some manufacturers suggest scraping, cutting, or scuffing the anodized coating. Unless the connection is sealed (as air-tight and water-tight) from the elements, the aluminum becomes exposed to the environment which increases the rate of oxidation and galvanic corrosion. Corrosion at the connection will cause an increase in the connection's resistance, and eventual failure of the bond. However, some equipment manufacturers do not permit removal of the protective anodized coating, such as galvanization, to make electrical contact. This is because removal of the coating will facilitate corrosion.

Tests conducted on a variety of bonding connections indicated that most typical connections failed quickly when exposed to deteriorating agents. Damp-heat resistances were relatively unchanged over a 20-week period. However, most samples corroded in just a few weeks for the salt-mist tests. Samples using an antioxidant lasted slightly longer before failing. Lay-in lugs with washers and grounding clips and compound lasted more than 20 weeks in the salt mist condition, but still failed. 2

Using connection hardware that is environmentally sealed (as air-tight and water-tight) against the effects of corrosion will not only make installations safer but will reduce costs for the owner/operator.

Using an environmentally sealed electrical bonding device and bonding fastener with environmental seals creates an air-tight and water-tight seal around the teeth which make the electrical bonding connection and protect it from corrosion. As the nut and bolt are tightened the twisted teeth bite into the facing surfaces of the frames to penetrate any surface corrosion or coating and create a solid electrical connection that is air-tight and water-tight sealed against the elements and the effects of corrosion. Please refer to Attachments 1-4 for photographs of environmentally sealed washers. As can be seen in Attachments 3 and 4, the washer clearly provided good contact with the aluminum surface, while the silicone protects the connection from corrosion.

Environmentally sealed hardware creates more secure electrical connections by providing 360-degree protection against corrosion and degradation. This is achieved by embedding the washer in an air and watertight silicone layer. The silicone layer prevents moisture and other contaminants from coming into contact with the washer and mating surface, which can help to prevent corrosion and degradation of the electrical connection.

As a result of these benefits, environmentally sealed hardware can help to create more secure electrical connections that are less likely to fail. This is important for safety, as it can help to prevent electrical fires and other hazards. Environmentally sealed hardware is also important for reliability, as they can help to ensure that electrical connections remain functional for longer periods of time.

Here are some of the specific benefits of using environmentally sealed connections:
- Increased resistance to corrosion
- Reduced risk of electrical fires and shock hazards
- Improved reliability
- Longer lifespan

Notes:
1. All-Copper Grounding Systems End Million Dollar Losses at Emergency Response System. [West, Donnelly, Sorley, 2016]
2. Accelerated Aging Tests on PV Grounding Connections [Wang et al., 2011]

Submitter Information Verification

Submitter Full Name: Merton Bunker
Organization: Merton Bunker & Associates, LLC
Affiliation: Evan W. Lipstein, Hyline Safety Company
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 05:56:30 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The application of a watertight or airtight seal of a termination is dependent on the environment and the listing of the product should address the robustness of the termination. The current language is clear.

Merton Bunker & Associates, LLC
22 Gray Birch Ln
Stafford, VA 22554
September 2, 2023

National Fire Protection Association
Attn: Standards Administration
1 Batterymarch Park
Quincy, MA 02169

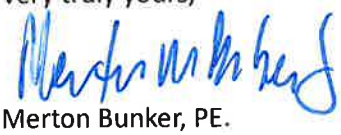
Please see the attached supporting material and related permission to use the material for Public Inputs 2411, 2412, 2413, 2414, 2415, 2492, and 2493. These attachments are the same for all referenced Public Inputs.

I am submitting this PI on behalf of HYLINE SAFETY COMPANY.

The material in all four attachments is not copyrighted; however, I have included permission to publish them from the originator of these attachments, Mr. Evan W. Lipstein.

Thank you in advance for your attention to this matter. If you have any questions or concerns, please contact me at the phone number below.

Very truly yours,

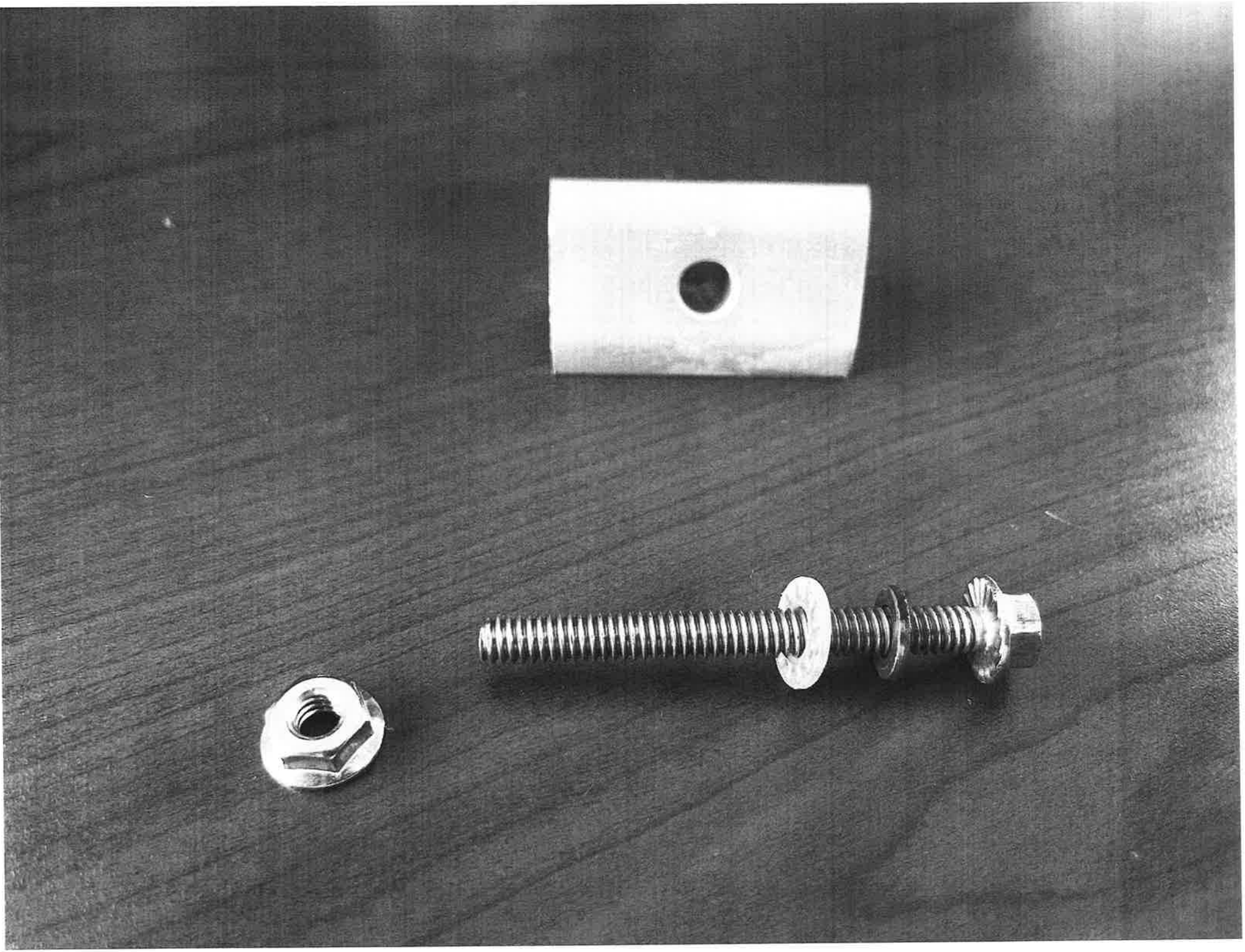


Merton Bunker, PE.

Attachment #1

Hardware with an environmentally sealed washer.

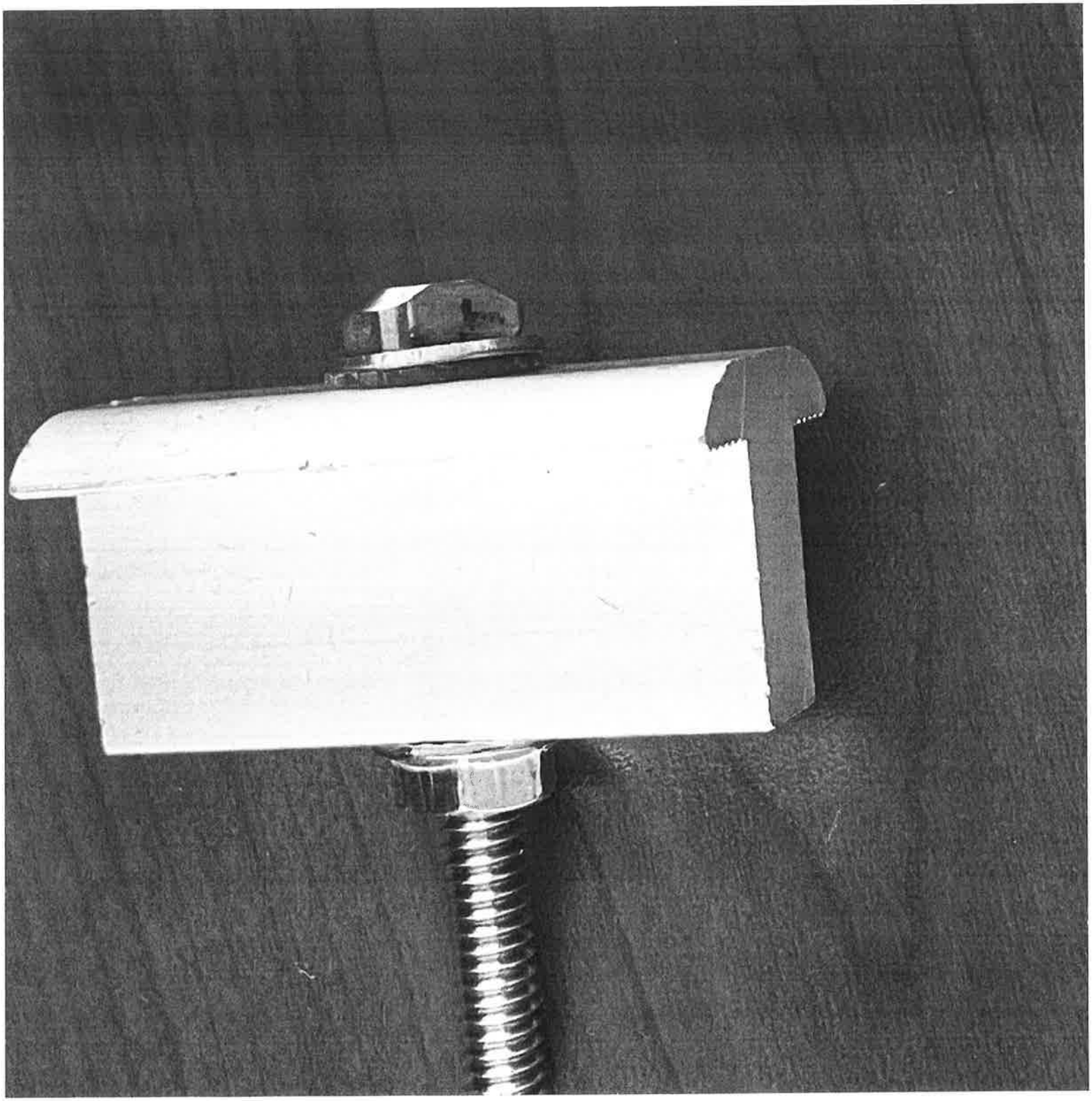
For Public Inputs 2411, 2412, 2413, 2414, 2415, 2492, and 2493.



Attachment #2

Hardware with an environmentally sealed washer.

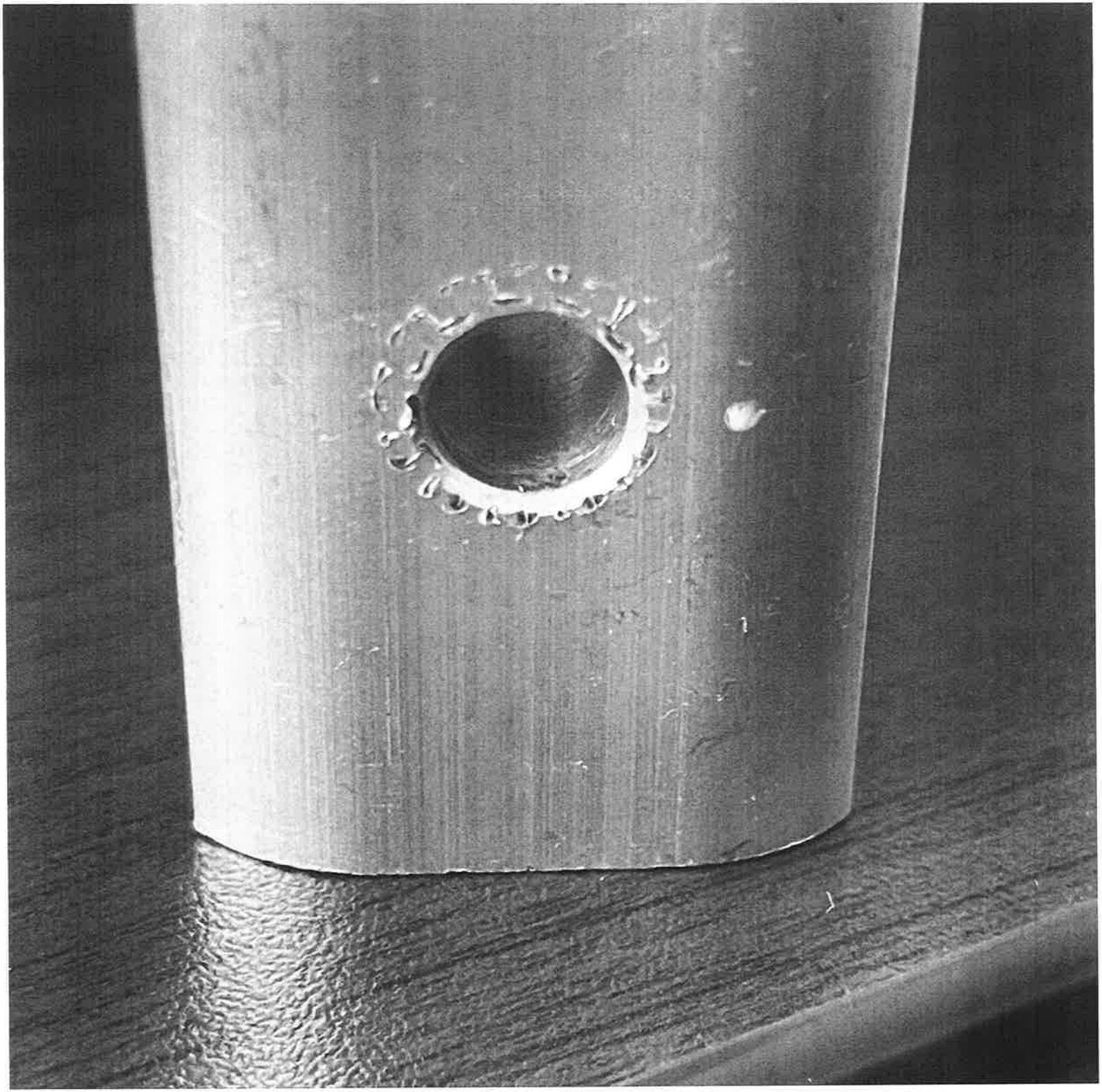
For Public Inputs 2411, 2412, 2413, 2414, 2415, 2492, and 2493.



Attachment #3

Aluminum surface showing contact by environmentally sealed washer.

For Public Inputs 2411, 2412, 2413, 2414, 2415, 2492, and 2493.



Attachment #4

Aluminum surface showing contact by environmentally sealed washer.

For Public Inputs 2411, 2412, 2413, 2414, 2415, 2492, and 2493.

Public Input No. 251-NFPA 70-2023 [Section No. 110.14 [Excluding any Sub-Sections]]

~~Because of different characteristics of dissimilar metals, devices~~ Devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment.

Connectors and terminals for conductors more finely stranded than Class B and Class C stranding as shown in Chapter 9, Table 10, shall be identified for the specific conductor class or classes.

Statement of Problem and Substantiation for Public Input

Galvanic corrosion is only one reason that terminals must be "properly installed and used." The language regarding dissimilar metals is addressed adequality in the second sentence, there is no reason to address it in the first sentence as well.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 31 13:17:32 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: There are products that are specific to Copper Only for their termination whether it is a device or connector. The current is language is clear.

Public Input No. 3640-NFPA 70-2023 [Section No. 110.14 [Excluding any Sub-Sections]]

(1) Identified for Material. Because of different characteristics of dissimilar metals, devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be identified for the material of the conductor and shall be properly installed and used.

(2) Dissimiliar Metals. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment.

(3) Finely Stranded Conductors. Connectors and terminals for conductors more finely stranded than Class B and Class C stranding as shown in Chapter 9, Table 10, shall be identified for the specific conductor class or classes.

Statement of Problem and Substantiation for Public Input

Breaking up 110.14 into a list item format to facilitate understanding for Code users. In accordance with NFPA Style Manual section 3.5.1.2 additional subdivisions shall be used where multiple requirements can be broken into independent requirements.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 11:16:23 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The current language and structure are clear.

Public Input No. 907-NFPA 70-2023 [Section No. 110.14 [Excluding any Sub-Sections]]

Because of different characteristics of dissimilar metals, devices such as pressure terminal or pressure splicing connectors and soldering lugs shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed in a terminal or splicing connector where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. ~~Materials~~ Copper-clad aluminum and copper are not dissimilar metals. Aluminum is a dissimilar metal to both copper and copper-clad aluminum. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment.

Connectors and terminals for conductors more finely stranded than Class B and Class C stranding as shown in Chapter 9, Table 10, shall be identified for the specific conductor class or classes.

Additional Proposed Changes

File Name	Description	Approved
L2211200Letter.pdf	Expert Statement from PHD Materials Scientist	
Whitepaper-CCA_vs_Al-v4.pdf	Mello White Paper: Important Differences Between CCA and Aluminum	

Statement of Problem and Substantiation for Public Input

A critical piece of user information was removed in the 2023 NEC revision cycle. The removal of the parenthetical statement in Section 110.14 Electrical Connections, results in installers and inspectors losing all reference in NFPA 70 that copper-clad aluminum and aluminum are dissimilar metals, and that copper and copper-clad aluminum are not dissimilar metals. In the action to remove the parentheticals, the panel created a potential for misapplication and hazard. For the application of electrical connections, clarity is paramount for safety. Intermixing two dissimilar metals (single-metal copper to single-metal aluminum, or copper-clad aluminum to single-metal aluminum) can lead to galvanic corrosion at points of connection, which has long been considered a hazard by this Code. Extensive laboratory testing, and over a half century of real-world usage, have established that copper-clad aluminum performs safely in electrical connections rated for copper because of their metallurgical similarity. However, the opposite is not true. CCA and aluminum are not similar metals. In short, there clearly exists the possibility of wrongfully intermixing single-metal aluminum to copper-clad aluminum in connectors rated AL.

In the 2020 cycle, Panel 1 established that copper-clad aluminum and copper are not dissimilar metals for electrical connection purposes (see the committee statement available to the public). This was established with technical substantiation provided to the panel. In the 2023 NEC, without a clear reference in Code stating otherwise (having removed the parentheticals), installers are now more inclined to interpret copper-clad aluminum and aluminum to be similar metals for the following reasons:

1. The two materials share ampacity columns in the highly referenced tables in article 310
2. The two materials share the word “aluminum” in their names
3. 90% of the cross-sectional area of CCA wire is aluminum, appearing to the user to be “mostly aluminum,” and therefore should be used as if it were aluminum

Installers are generally not metallurgists. Consequently, installers are more inclined to make an error without clear text to give them direction. Fearing galvanic corrosion, the NEC has spent many decades ensuring that dissimilar metals are never intermixed without employing devices, terminals and splice connectors specifically listed for such use. This proposed text aids clarity, resolves any style manual issues, and is in line with the NEC tradition of making sure dissimilar metals are never connected electrically. The fact that CCA and copper are similar metals is scientifically indisputable. This fact maintains consensus on the panel.

Please review the technical pieces submitted with this Public Input:

1. "Important Performance Differences Between CCA and Aluminum," by Chuck Mello
2. "A Statement from PhD Materials Scientist, Dr. William Kane" regarding dissimilar metals

Submitter Information Verification

Submitter Full Name: Peter Graser
Organization: Copperweld

Affiliation: American Bimetallic Association
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 10:06:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposal cites a similarity with copper and copper clad aluminum. There are products that are specific to “copper only” for their termination. Having a statement of similarity can be confusing to the user of the code. Ampacities are also different between the two types of conductors. The current language is clear.

Thornton Tomasetti

Via email: pgraser@copperweld.com

January 3, 2023

Peter Graser
Vice President - Building Wire
COPPERWELD
5141 Virginia Way, Suite 410
Brentwood, TN 37027

RE: ELECTRICAL CONNECTIONS WITH COPPER CLADDED ALUMINUM CONDUCTORS
TT Project No. L22112.00

Dear Mr. Graser:

Thank you for the opportunity to provide a materials science assessment for the above referenced matter. I have attached a copy of my Curriculum Vitae for your reference. At your request I have reviewed some factors around certain electrical connections in the latest revision of the NFPA 70 code. In particular, I reviewed the material issues regarding copper-clad aluminum (CCA) and dissimilar metal connections.

The similarity of two metals electrically connected and exposed to a common environment is determined by their electrochemical potentials, which is a measure of the energy driving corrosion. Metals with different electrochemical potentials in a given environment are considered dissimilar, and when two dissimilar metals are joined in a corrosive environment, they create a galvanic couple.[1] This coupling leads to galvanic corrosion, accelerated corrosion of a metal because of an electrical contact with a more noble metal or nonmetallic conductor. Accelerated corrosion due to dissimilar metal coupling has been observed and studied since at least the 18th century.

Bimetals are components consisting of two metals that are combined to achieve material properties that cannot be obtained with a single metal. A common means of producing bimetals involves coextrusion, the simultaneous extrusion or drawing of two metals to form an integrated product. This process was first developed in 1863 but gained more commercial application in the nuclear industry in the middle of the 20th century.[2] Coextrusion has been applied in a wide variety of industries, including for electrical applications where CCA is used in wire, rod, and bus bar forms. Thermo-mechanical processing during the production of CCA can produce a metallurgical bond between the copper cladding and aluminum core.[3]

[1] ASM Handbook, Volume 13 – Corrosion, ASM International, 1983.
[2] ASM Handbook, Volume 14A – Metalworking: Bulk Forming, 2005.
[3] Sasaki, T.T., et al., Scripta Materialia, Volume 63, Issue 5, 2010, pgs. 488-491.

When CCA is used in an electrical connection the copper cladding contacts the other components of the connection. As a result, CCA performs more like a solid copper conductor than a solid aluminum conductor. This is most evident in the values of electrical contact resistance for a given contact pressure, where CCA is comparable to copper and significantly less than aluminum.[4] Variations in contact resistance result from differences in the natural oxide layer that forms on the surface of metals, and the aluminum oxide that forms in ambient conditions has a much higher resistivity than the analogous copper oxide.[5] Therefore, CCA is similar to solid copper in both its electrical and electrochemical behavior, as was confirmed in thermocycling testing[6] and galvanic corrosion testing.[7] Like with a solid copper conductor, connecting a CCA conductor to aluminum creates a dissimilar metal couple and could lead to galvanic corrosion if an electrolyte is present.

Thornton Tomasetti is an engineering firm that optimizes the design and performance of structures, materials, and systems for projects of every size and level of complexity. We are an employee-owned organization of engineers, scientists, architects, and other professionals collaborating from offices worldwide. As a member of our Forensics practice, I am part of a multidisciplinary team with expertise to investigate and analyze a broad range of issues, including metallurgy, strength of materials, and environmental degradation. On behalf of the firm, thank you again for the opportunity to assist in this matter. If you have any additional questions, please do not hesitate to contact me.

Sincerely,

THORNTON TOMASETTI, INC.

William M. Kane
Vice President

[4] Meese, W.J. and Cilimberg, R.L., *Analysis of Current Technology on Electrical Connections in Residential Branch Circuit Wiring*, U.S. Dept. of Commerce, National Bureau of Standards, March 1975, pg. 7.
[5] Fan, J.C., *Mechanisms of Building Wire Connection Failure*, A Texas Instruments Engineering, Inc., report, Bulletin No. 516-TB93-1070.
[6] Eaton Laboratories, *Terminal and Conductor Temperature Testing of 14 AWG Copper-Clad Aluminum and 14 AWG Copper Conductors, Part II – Thermocycling Tests*, November 13, 2020.
[7] Westmoreland Mechanical Testing & Research, Inc., WMT&R Report 8-70626, August 6, 2018.

WILLIAM KANE, PH.D., P.E.

Vice President

Summary

William Kane joined the Philadelphia Forensics practice at Thornton Tomasetti in 2021, bringing 15 years of experience in failure analysis and prevention. He is a recognized expert in materials and mechanical engineering with concentrations in metallurgy, strength and performance of materials, and environmental degradation. Dr. Kane has consulted on a wide range of issues including medical devices and implants, utility and infrastructure components, consumer products, welding, buildings and structures, construction equipment, piping, industrial and pharmaceutical production equipment, railcars, and automotive components. He has experience in fracture mechanics, microscopy, mechanical testing, corrosion and materials selection. Dr. Kane has taught at the University of Pennsylvania and Drexel University, and has presented extensively in his field, as well as contributed to multiple publications.

Areas of technical expertise

- Root Cause Failure Analysis
- Environmental Degradation of Materials
- Materials Science and Engineering

Education

- Ph.D., Materials Science & Engineering, 2005, University of Pennsylvania
- M.S., Materials Science & Engineering, 2003, University of Pennsylvania
- B.S., Materials Science & Engineering, 2001, University of Pennsylvania

Registrations

- Licensed Professional Engineer in DE, MD, NJ, NY, PA, & VA
- Certified Welding Inspector (CWI), American Welding Society
- Certified ASNT ACCP Level II, American Society for Nondestructive Testing

Professional activities

- Member, ASM International
- Member, American Welding Society
- Member, ASTM International
- Board Member, Physical Sciences Technical Advisory Committee, Ben Franklin Technology Partners (BFTP)
- Lecturer, University of Pennsylvania, 2009-2018
- Adjunct Faculty, Drexel University, 2010-2012

Select project experience

Root cause failure analysis

Philadelphia Criminal Justice Center Elevator Failure, Philadelphia, PA.* Mechanical and metallurgical investigation to determine the cause of an elevator accident.

Arthroscopic Surgery Tool Failure, Ephrata, PA.* Metallurgical analysis of a fractured arthroscopic shaver tool to determine the cause of the failure.

Cervical Plate System Failure Analysis, Philadelphia, PA.* Metallurgical analysis of fractured screws from a medical device to determine the cause of the fracture.

Petroleum Tanker Rupture, Kaysville, UT.* Investigation into the rupture of a DOT tanker that was involved in a motor vehicle accident.

Six Flags Chiller Rollercoaster Wheel Failure, Jackson, NJ.* Investigation into the failure of welded components on an amusement park ride that failed during operation.

Huntington Station Crane Collapse, Alexandria, VA.* Mechanical and metallurgical investigation to determine the cause of a tower crane collapse.

Environmental degradation of materials

Pharmaceutical Water Storage Tank Failure, Philadelphia, PA.* Metallurgical investigation to determine the cause and extent of cracking in a 22,000-gallon distilled water storage tank.

Naudain Street Gas Explosion, Philadelphia, PA.* Metallurgical investigation to determine the cause and extent of pipe corrosion that contributed to a gas leak.

Materials science & engineering

Great Wolf Lodge Premises Investigation, Scotrun, PA.* Materials evaluation of the platform surfaces on an indoor water park feature.

*Denotes work performed with previous employer.

WILLIAM KANE, PH.D., P.E.

Lacrosse Ball Usability Study, Philadelphia, PA.* Materials evaluation examining the effects of aging on lacrosse balls.

Boiler Fitness-for-Service Assessment, Philadelphia, PA.* Investigation to determine the cause of cracking and remaining structural integrity of a steam boiler superheater header.

Sworn testimony

Trial experience

Nelson v. United States, U.S. District Court for the Eastern District of Pennsylvania, 2022.

Wright v. Residence Inn Philadelphia, et al,* Court of Common Pleas, Philadelphia County. 2017.

Osmun v. Pat's King of Steaks, et al,* Court of Common Pleas, Philadelphia County. 2017.

Steinman v. Spinal Concepts, Inc.,* U.S. District Court, Western District of NY. 2013.

State Farm Fire & Casulaty Co. v. Carroll Water Systems, Inc., et al,* In the District Court of MD for Carroll County. 2012.

Deposition experience

Viscovich v. Fendi S.R.L., et al, U.S. District Court for the Southern District of NY. 2021.

GATX Corp. v. Georgia Power Co.,* U.S. District Court for the Northern District of GA. 2021.

Malone v. Elsburty Jr., et al,* In the Circuit Court of Harrison County, WV. 2020.

Sherrick v. Sunrise Medical, et al,* Court of Common Please, Franklin County, OH. 2020.

Moxham, et al v. M&J Overhead Door LLC, et al,* Superior Court Judicial District of Danbury. 2019.

Lopez v. Ryder Truck Rental, Inc., et al,* Superior Court of NJ, Essex County. 2018.

Evans, et al v. Globus Medical, Inc., et al,* In the Circuit Court of Baltimore County, MD. 2016.

IPSCO Tubulars, Inc. v. Ajax Tocco Magnethermic Corp.,* U.S. District Court for the Eastern District of AR. 2013.

Select papers, lectures and publications

"Preservation and Preparation of Fracture Specimens," ASM Handbook, Volume 12 – Fractography, ASM International. In press as of Sept 2021 (author)

"Tibial tray fracture in a modern prosthesis with retrieval analysis," Arthroplast Today 2018; 4:143-147 (co-author)

"Retrieval and clinical analysis of distraction-based dual growing rod constructs for early-onset scoliosis," The Spine Journal 2017, 17(10): 1506-1518 (co-author)

"Preserving Evidence in a Product Liability Case: Focus on Medical Devices," American Bar Association Litigation Group, Expert Witnesses Committee Article, February 21, 2017 (co-author)

"Mechanical Properties and Their Measurement," ASM International Metallurgy for the Non-Metallurgist course, Coatesville, PA, November 2014 (author)

"Failure Analysis for Medical Device Engineers," ASM International, Materials Park, OH, August 2014 (author)

"Collapse of Jet Center Hangars Under Snow Load," 2014 Structures Congress, American Society of Civil Engineers, Boston, MA, April 2014 (co-author)

"Method of characterizing fretting and corrosion at the various taper connections of retrieved modular components from metal-on-metal total hip arthroplasty. ASTM STP1560: Metal-On-Metal Total Hip Replacement Devices," ASTM International, 2013 (co-author)

"In vivo deformation, surface damage, and biostability of retrieved dynesys systems," Spine, November 2010; 35(23):1310-E1316 (co-author)

"Brittle intergranular fracture of a Ni-based superalloy at high temperatures by dynamic embrittlement," Materials Science and Engineering A 2004; 387-389:409-413, December 15 (co-author)

"MSE 495/496 – Senior Design", University of Pennslyvania, 2012-2018 (lecturer)

"MSE 555 – Environmental Degradation of Materials", University of Pennslyvania, 2012-2016 (lecturer)

"Failure Analysis for Medical Device Engineers", ASM International, 2017 (lecturer)

"Fretting and corrosion at the taper connections of retrieved modular components from metal-on-metal total hip arthroplasty," Talk 13, Symposium on Metal-on-Metal Total Hip Replacement Devices, Phoenix, AZ, May 8, 2012 (co-presenter)

"Oxygen-induced dynamic embrittlement in nickel-based superalloys,.Interfacial Engineering for Optimized Properties III," MRS 2004; 819:111-120 (co-presenter)

CONTACT

Bill Kane
1700 Market Street, Suite 1750, Philadelphia PA 19103
267.238.4000
WKane@ThorntonTomasetti.com
www.ThorntonTomasetti.com

WHITEPAPER

Important Performance Differences Between Copper-Clad Aluminum and Aluminum

What the Data Shows in AC Impedance, DC Resistance and Splicing

by Chuck Mello

President, cdcmello Consulting LLC

Published 5/10/2023

Contents

Introduction

Some in the electrical industry hold two beliefs about copper-clad aluminum (CCA) conductors when used in power circuit applications. One of these beliefs is that conductors of CCA are just like single metal aluminum conductors and should therefore be treated in the same manner. The other belief is that at 60 Hz the current in CCA conductors runs mainly in the copper layer, like a "skin effect," rather than being distributed throughout the entire cross-section of the conductor. This white paper provides evidence that these beliefs are unfounded.

Origins of the Misunderstanding

Many in the electrical trade, including some in the regulatory community, believe that CCA conductors perform the same as aluminum conductors. This perceived equivalency may come from not recognizing that CCA is a bimetal, different than the two metals used to manufacture it.

Another source for misunderstanding may come from assumptions based on the structure of the National Electrical Code® (NEC®), which could do a better job differentiating the allowed conductor materials. Regardless, the evidence shows that CCA conductors perform uniquely from those made with aluminum. For baseline purposes, this white paper also provides testing data with copper conductors of equivalent ampacity. The following are a few points that demonstrate that CCA and aluminum as conductor materials are not the same and should be handled differently. These facts are easily verified using common electrical testing equipment and following industry adopted standard procedures.

> **...Evidence shows that CCA conductors perform uniquely from those made with aluminum.**

Following the Data

Comparing the Performance of CCA and Aluminum Conductors

A fundamental concept of small branch circuit conductor sizes, such as 14 - 10 AWG, including those constructed with CCA, is that AC current density is in fact more evenly distributed throughout the cross section of the conductor than one might think.

This is because the skin effect, i.e., the tendency of AC current to concentrate at the outside of conductors, is negligible at 60 Hz in these sizes of conductors, as the conductor diameter is small compared to the "skin depth," a metric describing the distance over which the skin effect takes place. This contrasts with very large conductors, such as 350 kcmil and larger, where the diameter is large enough to exhibit a pronounced uneven distribution of current, or with conductors used for data transmission or operating at radio frequencies, where the skin depth is much smaller due to the high frequency signals.

The negligible skin effect in building wire at 60 Hz can be demonstrated when one compares the differences between the conductor's DC resistance and its AC impedance. This white paper compares samples of 10 AWG solid aluminum conductor to 10 AWG solid CCA conductor. This size CCA or aluminum conductor would be applicable for a 20-ampere branch circuit in accordance with the NEC®.

All the testing described below was completed on three samples of each conductor material. The results reported here are the averages of those three measurements. The resistance testing was completed using a calibrated Megger Digital Low Resistance Ohmmeter (DLRO). The DC resistance test results of conductors of the same length (for this case, 100 feet) and size (10 AWG) at a current of 10 amps, found the measured DC resistance of CCA to be on average approximately 11.28 mΩ or 6.69% lower than aluminum, see Table 1. It is logical that CCA has a lower DC resistance since 27% of the CCA's mass is copper — more copper, lower overall resistance.

Impedance measurements for the 100 feet of conductor were completed using a calibrated Keysight E4980A LCR meter and validated with a Keysight E4990A Impedance Analyzer. The test results at 60 Hz, found the difference for the resistance part of the impedance between 10 AWG CCA and 10 AWG aluminum of equal lengths is on average 11.60 mΩ or 6.93% less for CCA. In that the copper of CCA is highly concentrated at the periphery of the conductor, if current were to be most dense at the skin, then CCA should have much less impedance than aluminum. These results demonstrate that it does not. As shown in the data, Table 1, the difference between the DC test at 11.28 mΩ and the AC test at 11.60 mΩ shows almost identical results.

The testing results for the same wire samples comparing the total AC impedance at 60 Hz for 10 AWG CCA to 10 AWG aluminum, indicates a difference of 11.93 mΩ or 7.06% less for CCA, see Table 1.

As shown in Table 1, comparing the average DC resistance and the average 60 Hz AC impedance for CCA, they are essentially equal. If AC current at 60 Hz were to be heavily concentrated (denser) at the periphery of a conductor, as many incorrectly believe, the percentage difference for the AC impedance of CCA would be significantly higher than that found when comparing CCA to CCA or CCA to aluminum. Ten percent of CCA's cross-sectional area is highly conductive copper, all of which is located at the periphery of the wire in a thick band where the AC current is presumed to be the densest. The conclusion from the above data indicates that AC current at 60 Hz is more evenly distributed throughout the entire cross-section of the conductor than conventional wisdom has led many to believe.

> **AC current at 60 Hz is actually more evenly distributed throughout the entire cross-section of the conductor than conventional wisdom has led many to believe.**

The DC Resistance/AC Impedance of CCA and Aluminum Are Not the Same

In gaining the above insights of current density in small conductors for AC circuits at 60 Hertz, another important fact has been uncovered. Even though the NEC treats CCA and aluminum as being the same, CCA is a more electrically efficient conductor than aluminum size for size. When comparing CCA and aluminum of the same diameter and length, CCA measures both a lower DC resistance and lower AC impedance. Below is a comparison based upon averages of multiple sets of readings and samples:

Table 1

Comparative DC Resistance and 60 Hz AC Impedance for 100 Feet of Conductor @20°C

Size (AWG)	Material	NEC Ampacity[1,2] (Amps) (A)	Average DC Resistance Measured with 4-lead Digital Low Resistance Ohmmeter (mΩ)	Average AC Resistance Measure with 4-Lead Precision Impedance Meter (mΩ)	Average AC Impedance Measure with 4-Lead Precision Impedance Meter (mΩ)
10	Copper-clad Aluminum	25	157.34	155.827	156.983
12	Copper	20	161.89	161.43	161.33
10	Aluminum	25	168.623	167.433	168.917

Notes: 1 The ampacity is from NEC Table 310.16 at the 60°C rating for relative comparison

2 These conductors would be typically applied for 20-ampere branch circuits and are limited to 20-ampere overcurrent devices in accordance with NEC 240.4(D).

CCA Compared to Copper Conductors

As shown in the cross-section images in Figures 1 and 2 below, the construction of CCA has an area comprised of a maximum 90% aluminum center with a minimum 10% copper outer layer that is metallurgically bonded to the aluminum center. This equates to 27% mass for the copper and 73% mass for the aluminum. For equivalency's sake, applications in the NEC require CCA to be increased by two AWG sizes in relation to copper, such as 12 AWG copper to 10 AWG CCA, reference NEC® Table 310.16.

From the testing conducted for this white paper, it should also be noted that when compared to copper conductors of two AWG sizes smaller, CCA was found to have a lower DC resistance and AC impedance, see Table 1. This has important implications for equivalency in performance. Generally, lower resistance in one conductor over another equates to lower heat generation from the wire and helps to reduce heat generation at termination points. In an overcurrent condition, a lower total conductor and connector contact resistance can make all the difference between a conductor or connection overheating or not overheating. As discussed below, the total resistance for CCA in splices is close to that of copper, and significantly less than aluminum.

Figure 1

Cross Section of CCA Construction (10 AWG)

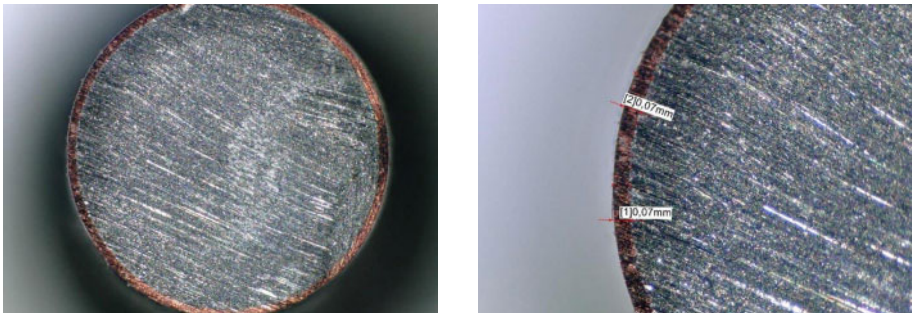


Figure 2

Longitudinal Cross Section of CCA Construction

The Performance of Conductors in Electrical Connections

DC Resistance of CCA and Aluminum at Splice Points

In addition to the above discussion on the conductor itself, more insightful data can be acquired about CCA when measuring the resistance of connector assemblies, such as wire splicing connectors. The resistance of CCA in splicing connectors compared to aluminum and copper is a case in point. Understanding the resistance at splice points is important because the resistance of the assembly can be equated to electrical efficiency and heat generation at the splicing connector.

Again, test results comparing splices of 10 AWG CCA to both 10 AWG aluminum and 12 AWG copper under equivalent test conditions, found a significant difference in the resistance between the assembly for CCA and aluminum conductors. All the connections were of the same conductor material, CCA to CCA, copper to copper, and aluminum to aluminum. See Figure 4 for a graphical representation of the test setup and Tables 2, 3 and 4 for the test data.

The average DC resistance for splices with 10 AWG CCA is approximately half that for splices using 10 AWG aluminum and effectively equivalent to 12 AWG copper. As shown in the photos below, Figure 3, the assembly of copper, CCA or aluminum conductors in a wire splicing device was measured with a precision 4-point resistance measuring meter. These measurements were taken at a location just outside the splice connector to minimize the resistance measurement contribution of the bulk conductors. To validate the measured resistance results, separate tests were completed at the typical rated current by injecting 20 amps DC from a regulated power supply into the circuit and measuring the voltage drop.

Figure 3

Splice Connector Testing Setup

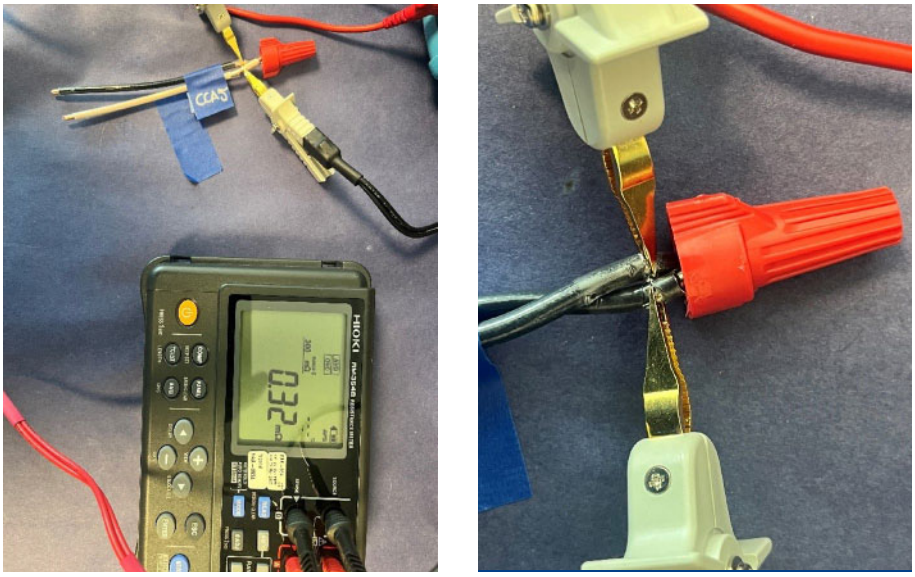


Figure 4

Graphical Representation of Data

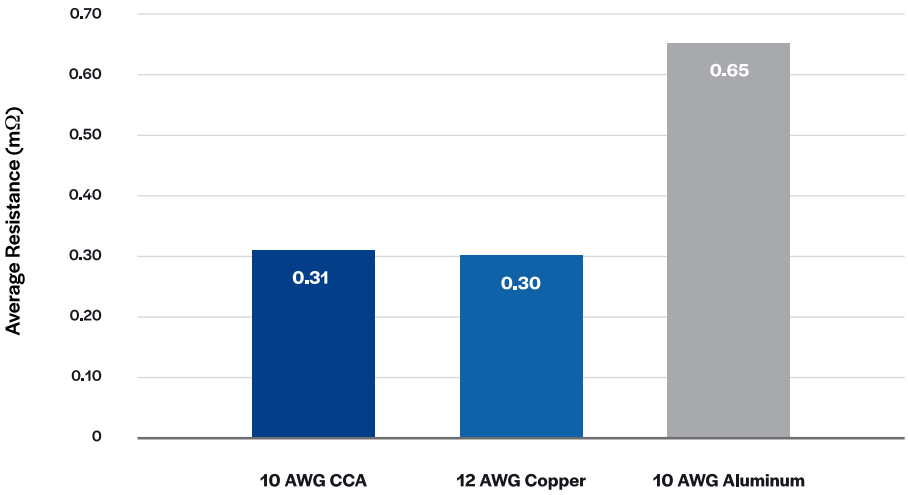


Table 2

DC Resistance of CCA at a Splice Connection at 5 In/lb[1]. Torque @ 20 Amps

Sample (10 AWG Copper-Clad Aluminum, CCA)	Unloaded Resistance directly measured using precision ohmmeter (mΩ)	Measured voltage drop with of 20 Amp DC current (mV)	Calculated resistance (mΩ)
CCA #1	0.265	5.5	0.275
CCA #2	0.29	5.9	0.295
CCA #3	0.30	6.1	0.305
CCA #4	0.33	6.7	0.335
CCA #5	0.33	6.7	0.335
CCA #6	0.30	6.1	0.305
Average	**0.30**	**6.17**	**0.310**

Table 3

DC Resistance of Copper at a Splice Connection at 5 In/lb[1]. Torque @ 20 Amps

Sample (12 AWG Copper, CU)	Unloaded Resistance directly measured using precision ohmmeter (mΩ)	Measured voltage drop with of 20 Amp DC current (mV)	Calculated resistance (mΩ)
CU #1	0.28	5.6	0.280
CU #2	0.31	6.3	0.315
CU #3	0.29	5.9	0.295
CU #4	0.32	6.6	0.330
CU #5	0.25	5.2	0.260
CU #6	0.31	6.3	0.315
Average	**0.29**	**5.98**	**0.30**

Table 4

DC Resistance of Aluminum at a Splice Connection at 5 In/lb[1]. Torque @ 20 Amps

Sample (10 AWG Aluminum, AL)	Unloaded Resistance directly measured using precision ohmmeter (mΩ)	Measured voltage drop with of 20 Amp DC current (mV)	Calculated resistance (mΩ)
AL #1	0.64	13.3	0.665
AL #2	0.69	14.1	0.705
AL #3	0.60	12.3	0.615
AL #4	0.64	12.8	0.640
AL #5	0.60	12.2	0.610
AL #6	0.66	13.2	0.660
Average	**0.64**	**12.98**	**0.615**

Notes: 1 The torque values were calculated using the test setup method specified in UL 486(C) paragraph 9.1.9.4.

2 Unloaded resistance measurements obtained using Hioki RM3548 high-precision resistance meter. Loaded resistance calculated by applying 20 A DC through the splice connections using a Sorensen DCS20-60E power supply, measuring the voltage drop using a Fluke 87V multimeter, and calculating the resistance.

The above information is important to understand for designers, installers, and electrical inspectors. Based on the testing, properly installed splicing connectors found CCA to be effectively equivalent to copper and twice as efficient as aluminum.

The primary reason for the poorer performance of aluminum is the existence of an insulating surface oxide layer inherent to that metal. Aluminum oxide is a poor electrical conductor, and forms in milliseconds on the surface of aluminum when exposed in open air. Therefore, for current to pass through a splice made with aluminum wire, the surface oxide layer must be cracked, and not allowed to reform. Only then can the current flow and it only flows through the penetrations.

On the other hand, CCA has no aluminum oxide layer and the interface of CCA to the connector or another conductor is copper. During the manufacturing of CCA, in an oxygen free environment, the oxide layer is completely removed from the aluminum surface before being bonded to a thick layer of highly conductive oxygen-free copper through a metallurgical bonding process. The result is a bimetallic conductor, with the beneficial properties of both metals. The bimetallic conductor has decreased overall resistance, lighter weight, and eliminates the highly resistive aluminum oxide layer where the copper is the material in contact with connectors and other conductors.

Summary

Data and science drive changes to one's perspective, as well as to the conventional wisdom of an industry. This new evidence about copper-clad aluminum's performance is being used in the codes and standards development process to drive change and provide clearer guidance to designers, installers, and inspectors on how to regulate installations made with CCA conductors.

The information and testing results provided in this white paper reinforce the following concepts:

- ✓ The copper of CCA is primarily employed for electrical connections and terminations and the current will flow through the entire cross section of a small circuit conductor.
- ✓ The thick copper cladding allows for easy current flow from the conductor at points of electrical connection.
- ✓ CCA is not the same as an aluminum conductor.
- ✓ For connections, CCA is also not dissimilar to copper metallurgically, both in terms of how it terminates and splices, as well as in terms of how it performs.

Public Input No. 755-NFPA 70-2023 [Section No. 110.15]

110.15 High-Leg Marking.

On a 4-wire, delta-connected system where the midpoint of one phase winding is grounded, only the conductor or busbar having the higher phase voltage to ground ~~shall be durably and permanently marked~~ is permitted to be marked by an outer finish that is orange in color or by other effective means. The high leg shall be durably and permanently marked by that. No other conductor or busbar may be marked with orange even if orange is not used for the high leg. Such identification shall be placed at each point on the system where a connection is made if the grounded conductor is also present.

Statement of Problem and Substantiation for Public Input

Since "shall" is synonymous with "must" in model code and legislative documents, the old wording only required the high leg to be marked with orange or other effective means and did not forbid other conductors from using those markings. That is unlike grounded and grounding conductors where the respective colors of while and green are prohibited from being used on other conductors unless meeting specific exceptions. The purpose of the high-leg marking is to distinguish the high leg from other legs, so the color orange should be reserved exclusively (possibly with exceptions) for the high leg.

Furthermore, old wording was silent on whether orange was allowed on other conductors if another color (such as purple as required by the modified local version of the NEC in San Francisco) was used for the high leg. This also adds new statement that explicitly prohibits orange on non-high-leg conductors in places such as San Francisco.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 01 01:32:03 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9121-NFPA 70-2024
Statement: Additional text clarifies the application of the requirement. The color orange must be included in any other effective marking means.

Public Input No. 3819-NFPA 70-2023 [Section No. 110.16]

110.16 Arc-Flash and Hazard Warning Labeling .

(A) ~~General~~ Hazard Warning Label .

Electrical equipment, such as switchboards, switchgear, enclosed panelboards, industrial control panels, meter socket enclosures, and motor control centers, that is in other than dwelling units, and is likely to require examination, adjustment, servicing, or maintenance while energized, shall be field or factory marked to warn qualified persons of potential electric arc flash hazards. The marking shall meet the requirements in 110.21(B) and shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

(B) ~~Service Equipment and Feeder Supplied Equipment~~ Arc Flash Label .

In other than dwelling units, in addition to the requirements in 110.16(A), a permanent arc flash label shall be field or factory applied ~~to service equipment and feeder supplied equipment rated 1000~~ to equipment rated 800 amperes or more. The arc flash label shall be in accordance with applicable industry practice and include the date the label was applied. The label shall meet the requirements of 110.21(B).

Informational Note No. 1: See ANSI Z535.4-2011 (R2017), *Product Safety Signs and Labels*, for guidelines for the design of safety signs and labels for application to products.

Informational Note No. 2: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for applicable industry practices for equipment labeling. This standard provides specific criteria for developing arc-flash labels for equipment that provides nominal system voltage, incident energy levels, arc-flash boundaries, minimum required levels of personal protective equipment, and so forth.

Statement of Problem and Substantiation for Public Input

This public input addresses a few issues with this section.

1. The title of this section is arc flash hazard warning but the section requires two types of labels. the first is a generic arc flash hazard label to warn of a potential. The other is an actual arc flash label. The title of the section and the titles of both first level sub divisions are being changed to more accurately describe the requirements of this section.
2. The second item being addressed is the removal of service equipment and feeder supplied equipment. In reality both and any equipment of the specified ampere rating presents the same hazard and should be treated the same.
3. Finally this public input aligns the cut-off with the ampere rating of 800A instead of 1000A as that better aligns with the cutoff points for circuit breakers as part of UL 489. It also aligns with fuse family cutoff points. In addition, 800A equipment and 1000a equipment have the same hazards.

Submitter Information Verification

Submitter Full Name: Thomas Domitrovich
Organization: Eaton Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 17:46:56 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9124-NFPA 70-2024
Statement: The revision to the title and reorganization of 110.16 will clarify the marking requirements of electrical equipment on the hazards of arc flash. The expansion to all service and feeder supplied equipment better correlates with recognized industry practices.

Public Input No. 70-NFPA 70-2023 [Section No. 110.16(A)]

(A) General.

Electrical equipment, such as switchboards, switchgear, enclosed panelboards, industrial control panels, meter socket enclosures, and motor control centers ~~,~~ that is ~~in other than dwelling units, and is~~ likely to require examination, adjustment, servicing, or maintenance while energized, shall be field or factory marked to warn qualified persons of potential electric arc flash hazards. The marking shall meet the requirements in 110.21(B) and shall be located so as to be clearly visible ~~to qualified persons~~ before examination, adjustment, servicing, or maintenance of the equipment.

Statement of Problem and Substantiation for Public Input

Unlike 110.16B, 110.16A requires a generic warning label to warn of arc flash hazards generally associated with electrical equipment. The qualified person doesn't need this warning as they should be well educated on this risk. This person more likely needs an arc flash label that has specifics in order to select PPE. The person in the dwelling unit is the one who could benefit from such a generic label. This PI seeks to remove the "other than dwelling unit" text.

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 07 18:05:13 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Dwelling unit electrical equipment does not correlate with recognized industry practices. The submitter has not substantiated that arc flash hazard marking should be required in a dwelling unit.

Public Input No. 4207-NFPA 70-2023 [Section No. 110.16(B)]

(B) Service Equipment and Feeder Supplied Equipment.

In other than dwelling units, in addition to the requirements in 110.16(A), a permanent arc flash label shall be field or factory applied to service equipment and feeder supplied equipment rated 1000 amperes or more. The arc flash label shall meet the requirements of 110.21(B) . The arc flash label shall be in accordance with applicable industry practice and ~~include the~~ contain the following information:

(1) The date the label was applied~~. The label shall meet the requirements of 110.21(B) .~~

(2) Nominal system voltage

(3) Arc flash boundary

(4) At least one of the following:

a. Available incident energy and the corresponding working distance

b. Minimum arc rating of clothing

c. Site-specific level of PPE

Informational Note No. 1: See ANSI Z535.4-2011 (R2017), *Product Safety Signs and Labels*, for guidelines for the design of safety signs and labels for application to products.

Informational Note No. 2: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for applicable industry practices for equipment labeling. This standard provides specific criteria for developing arc-flash labels for equipment that provides nominal system voltage, incident energy levels, arc-flash boundaries, minimum required levels of personal protective equipment, and so forth.

Statement of Problem and Substantiation for Public Input

When determining whether equipment has been installed correctly or properly maintained, an electrician in the field may not be able to identify the components of an arc flash label that is in accordance with applicable industry practices. It will be easier to meet and enforce the arc-flash hazard warning requirements if the label contents are clearly stated as a list rather than requiring users to consult and interpret additional industry standards. The Arc-flash hazard warning will be more effective at increasing safety protocols if electricians can expect to find the same information on all service equipment.

Submitter Information Verification

Submitter Full Name: Nick Starks
Organization: Denver Joint Electrical Apprenticeship and Training Committee
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 22:28:38 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9124-NFPA 70-2024
Statement: The revision to the title and reorganization of 110.16 will clarify the marking requirements of electrical equipment on the hazards of arc flash. The expansion to all service and feeder supplied equipment better correlates with recognized industry practices.

Public Input No. 71-NFPA 70-2023 [Section No. 110.16(B)]

(B) Service Equipment and Feeder Supplied Equipment.

In other than dwelling units, in addition to the requirements in 110.16(A), a permanent arc flash label shall be field or factory applied to service equipment and feeder supplied equipment rated 1000 amperes or more. The arc flash label shall be in accordance with applicable industry practice and include the nominal system voltage, the available incident energy at a specified working distance, the distance from the equipment at which the incident thermal energy is at or below 1.2 cal/cm^2, and the date the label was applied. The label shall meet the requirements of 110.21(B). Arc flash hazard warning labels complying with NFPA 70E shall be considered as compliant with this requirement.

Informational Note No. 1: See ANSI Z535.4-2011 (R2017), *Product Safety Signs and Labels*, for guidelines for the design of safety signs and labels for application to products.

Informational Note No. 2: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for applicable industry practices for equipment labeling. This standard provides specific criteria for developing arc-flash labels for equipment that provides nominal system voltage, incident energy levels, arc-flash boundaries, minimum required levels of personal protective equipment, and so forth.

Statement of Problem and Substantiation for Public Input

The 2023 revision is said to require an actual arc flash label that is complaint with NFPA 70E, yet the text would not indicate so. Instead, one would need to look at publications like the one from NFPA below, in which it may be considered that the author opines (in an article where NFPA has placed a disclaimer saying it's only the author's opinion) that "accepted industry practice" means NFPA 70E. What's accepted practice in one jurisdiction with a large industrial base may not be accepted in another with few larger electrical systems. It is believed that the rule should be less ambiguous.

https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/NFPA-Today/Blog-Posts/2022/03/08/All-signs-point-to-required-labeling-as-a-major-ally-in-the-pursuit-of-safety-of-electrical-work

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 07 18:09:15 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9124-NFPA 70-2024
Statement: The revision to the title and reorganization of 110.16 will clarify the marking requirements of electrical equipment on the hazards of arc flash. The expansion to all service and feeder supplied equipment better correlates with recognized industry practices.

Public Input No. 891-NFPA 70-2023 [Section No. 110.16(B)]

(B) Service Equipment and Feeder Supplied Equipment.

In other than dwelling units, in addition to the requirements in 110.16(A), a permanent arc flash label shall be field or factory applied to service equipment and feeder supplied equipment rated ~~1000 amperes~~ 800 amperes or more. The arc flash label shall be in accordance with applicable industry practice and include the date the label was applied. The label shall meet the requirements of 110.21(B).

(C) In addition to the requirements of 110.16(A) and (B), a permanent arc flash label shall be field applied in accordance with NFPA 70E noting incident energy, restricted boundary, limited approach boundary, arc flash boundary, and proper PPE on all switchboards, panelboards, disconnects, industrial control panels in occupancy's such as hospitals, educational facilities, industrial facilities, and the like where it is likely regular maintenance and modifications or additions are performed by maintenance personnel.

Informational Note No. 1: See ANSI Z535.4-2011 (R2017), *Product Safety Signs and Labels*, for guidelines for the design of safety signs and labels for application to products.

Informational Note No. 2: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for applicable industry practices for equipment labeling. This standard provides specific criteria for developing arc-flash labels for equipment that provides nominal system voltage, incident energy levels, arc-flash boundaries, minimum required levels of personal protective equipment, and so forth.

Statement of Problem and Substantiation for Public Input

As many as 2,000 individuals are injured and 300 killed each year in the USA alone according to some statistics. In large electrical installations noted in change, an arc flash study and labeling is a minimal cost and widely available to the industry. This will not cause an undo burden of cost on owners and will continue to expand protection to persons and property.
An additional consideration in this change would be that an arc flash and blast is a product of energy and time. A 100 amp 480 volt panelboard possibly may have incident energy levels 20 cal/cm2 or higher due to utility fuses time delay. I recently encountered this where multiple services were from a 500 KVA utility transformer. The 100A panel had an incident energy calculation of 21 cal/cm2. The 1600A switchboard had an incident energy of 31 cal/cm2. Personnel make the mistake of assuming the 100A panelboard represents a much lower risk than the switchboard when in fact they are exposed to a great hazard. Requiring NFPA 70E arc flash labels will bring awareness to this hazard at a minimal cost.

Submitter Information Verification

Submitter Full Name: Matt johnson
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 25 09:13:33 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9124-NFPA 70-2024
Statement: The revision to the title and reorganization of 110.16 will clarify the marking requirements of electrical equipment on the hazards of arc flash. The expansion to all service and feeder supplied equipment better correlates with recognized industry practices.

Public Input No. 2402-NFPA 70-2023 [Section No. 110.17]

110.17 Servicing, Maintenance, and ~~Maintenance of~~ Replacement of Equipment.

(A) Servicing and Maintanance. Servicing and electrical preventive maintenance shall be performed by qualified persons trained in servicing and maintenance of equipment and shall comply with the following:

(1) The servicing and electrical preventive maintenance shall be performed in accordance with the original equipment manufacturer's instructions and information included in the listing information, applicable industry standards, or as approved by the authority having jurisdiction.

(2) The servicing and electrical preventive maintenance shall be performed using identified replacement parts that are verified under applicable product standards. The replacement parts shall comply with at least one of the following:

(3) Be provided by the original equipment manufacturer

(4) Be designed by an engineer experienced in the design of replacement parts for the type of equipment being serviced or maintained

(5) Be approved by the authority having jurisdiction

(B) Replacement. When modifications or replacements of existing electrical equipment are necessary, they shall be required to be identified, documented, and repaired by a qualified person to the minimum requirements of the edition of this Code, unless modified elsewhere throughout this Code.

Informational Note No. 1: For equipment that is not listed or field labeled, or for which components are no longer available from the original equipment manufacturer, one way to determine suitability is to review the documentation that accompanies the replacement parts.

Informational Note No. 2: See NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*, for information related to preventive maintenance for electrical, electronic, and communication systems and equipment.

Statement of Problem and Substantiation for Public Input

There are many scenarios where the NEC requires replacement equipment to comply with the latest edition of the Code, for example in 230.85(D) for emergency disconnects in one-and-two family dwellings. Other times the NEC specifically gives certain allowances as in 408.9 for panelboards. There should be a general rule that unless the Code says otherwise any electrical equipment that is replaced should be installed to the latest edition of the NEC.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 16:48:00 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The submitter has not adequately substantiated why there should be a general rule that, unless the Code says otherwise, any electrical equipment that is replaced should be installed to the latest edition of the NEC. Further, the NEC, per 90.5(A), "should" is not mandatory and is therefore not suitable as a requirement. It is also unclear what is intended by "the latest edition of the NEC." Is it the most current edition that is published by NFPA, the most current edition adopted by the jurisdiction where the installation is being inspected, or is it something else?

Public Input No. 256-NFPA 70-2023 [Section No. 110.17]

~~**110.17** Servicing and Maintenance of Equipment.~~

~~Servicing and electrical preventive maintenance shall be performed by qualified persons trained in servicing and maintenance of equipment and shall comply with the following:~~

(1) ~~The servicing and electrical preventive maintenance shall be performed in accordance with the original equipment manufacturer's instructions and information included in the listing information, applicable industry standards, or as approved by the authority having jurisdiction.~~

(2) ~~The servicing and electrical preventive maintenance shall be performed using identified replacement parts that are verified under applicable product standards. The replacement parts shall comply with at least one of the following:~~

(3) ~~Be provided by the original equipment manufacturer~~

(4) ~~Be designed by an engineer experienced in the design of replacement parts for the type of equipment being serviced or maintained~~

(5) ~~Be approved by the authority having jurisdiction~~

~~Informational Note No. 1:~~ ~~For equipment that is not listed or field labeled, or for which components are no longer available from the original equipment manufacturer, one way to determine suitability is to review the documentation that accompanies the replacement parts.~~

~~Informational Note No. 2:~~ ~~See NFPA 70B,~~ ~~*Recommended Practice for Electrical Equipment Maintenance*~~ ~~, for information related to preventive maintenance for electrical, electronic, and communication systems and equipment.~~

Statement of Problem and Substantiation for Public Input

Servicing and maintaining equipment is not within the Scope of the NEC. Section 90.2(C) indicates that the NEC applies to the INSTALLATION of equipment, not the maintenance or servicing. This material belongs in NFPA 70B.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 31 15:10:13 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9274-NFPA 70-2024
Statement: Servicing and maintenance is retained in this section as it is covered in this Code per 90.2(C) [see FR-9273]. The servicing and maintenance requirements differentiate it from reconditioning.

Public Input No. 3823-NFPA 70-2023 [Section No. 110.17]

110.17 Servicing and Maintenance of Equipment.

Servicing and electrical preventive maintenance shall be performed by qualified persons trained in servicing and maintenance of equipment and shall comply with the following:

(1) The servicing and electrical preventive maintenance shall be performed in accordance with the original equipment manufacturer's instructions and information included in the listing information, applicable industry standards, or as approved by the authority having jurisdiction.

(2) The servicing and electrical preventive maintenance shall be performed using identified replacement parts that are verified under applicable product standards. The replacement parts shall comply with at least one of the following:

(3) Be provided by the original equipment manufacturer

(4) Be designed by an engineer experienced in the design of replacement parts for the type of equipment being serviced or maintained

(5) Be approved by the authority having jurisdiction

(6) The equipment shall be field marked with the date that the servicing and electrical preventative maintenance was completed.

Informational Note No. 1: For equipment that is not listed or field labeled, or for which components are no longer available from the original equipment manufacturer, one way to determine suitability is to review the documentation that accompanies the replacement parts.

Informational Note No. 2: See NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*, for information related to preventive maintenance for electrical, electronic, and communication systems and equipment.

Statement of Problem and Substantiation for Public Input

The 2023 NFPA 70B, the Standard for Electrical Equipment Maintenance, has maintenance intervals for various types of equipment, such as panelboards, switchboards, switchgear, motor control centers, switches, molded case circuit breakers and fuses. Labeling the servicing date on the equipment will help users comply with the guidelines from NFPA 70B to ensure the equipment is in safe and proper operating condition. This will also help comply with safety related maintenance requirements for electrical equipment from NFPA 70E chapter 2.

Submitter Information Verification

Submitter Full Name: Jon Borjas
Organization: Eaton - Bussmann
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 17:49:12 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The marking requirement is best suited for the Electrical Maintenance Plan developed by the facility in accordance with NFPA 70B.

Public Input No. 4205-NFPA 70-2023 [Section No. 110.17]

~~**110.17** Servicing and Maintenance of Equipment.~~

~~Servicing and electrical preventive maintenance shall be performed by qualified persons trained in servicing and maintenance of equipment and shall comply with the following:~~

(1) ~~The servicing and electrical preventive maintenance shall be performed in accordance with the original equipment manufacturer's instructions and information included in the listing information, applicable industry standards, or as approved by the authority having jurisdiction.~~

(2) ~~The servicing and electrical preventive maintenance shall be performed using identified replacement parts that are verified under applicable product standards. The replacement parts shall comply with at least one of the following:~~

(3) ~~Be provided by the original equipment manufacturer~~

(4) ~~Be designed by an engineer experienced in the design of replacement parts for the type of equipment being serviced or maintained~~

(5) ~~Be approved by the authority having jurisdiction~~

~~Informational Note No. 1:~~ ~~For equipment that is not listed or field labeled, or for which components are no longer available from the original equipment manufacturer, one way to determine suitability is to review the documentation that accompanies the replacement parts.~~

~~Informational Note No. 2:~~ ~~See NFPA 70B,~~ ~~*Recommended Practice for Electrical Equipment Maintenance*~~ ~~, for information related to preventive maintenance for electrical, electronic, and communication systems and equipment.~~

Statement of Problem and Substantiation for Public Input

110.17 on Servicing and Maintenance should not have been added to the Code. "Maintenance" and "electrical preventative maintenance" are outside the scope of the NEC. NFPA 70 is intended for installations, NFPA 70E intended for safe work practices and NFPA 70B (now elevated to a Standard from a Recommended Practice) intended for maintenance.

Submitter Information Verification

Submitter Full Name: Louis Barrios
Organization: Shell Global Solutions
Affiliation: American Chemistry Council (ACC)
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 22:21:53 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9274-NFPA 70-2024
Statement: Servicing and maintenance is retained in this section as it is covered in this Code per 90.2(C) [see FR-9273]. The servicing and maintenance requirements differentiate it from reconditioning.

Public Input No. 501-NFPA 70-2023 [Section No. 110.17]

110.17 Servicing and Maintenance of Equipment.

Servicing and electrical preventive maintenance shall be performed by qualified persons trained in servicing and maintenance of equipment and shall comply with the following:

(1) The servicing and electrical preventive maintenance shall be performed in accordance with the original equipment manufacturer's instructions and information included in the listing information, applicable industry standards, or as approved by the authority having jurisdiction.

(2) The servicing and electrical preventive maintenance shall be performed using identified replacement parts that are verified under applicable product standards. The replacement parts shall comply with at least one of the following:

(3) Be provided by the original equipment manufacturer

(4) Be designed by an engineer experienced in the design of replacement parts for the type of equipment being serviced or maintained

(5) Be approved by the authority having jurisdiction

Informational Note No. 1: For equipment that is not listed or field labeled, or for which components are no longer available from the original equipment manufacturer, one way to determine suitability is to review the documentation that accompanies the replacement parts.

Informational Note No. 2: See NFPA 70B, ~~Recommended Practice for~~ *Standard for Electrical Equipment Maintenance*, for information related to preventive maintenance for electrical, electronic, and communication systems and equipment.

Statement of Problem and Substantiation for Public Input

Terra seems to have underlined more than intended by this proposed change. The only change recommended is to update the title of 70B in informational note No. 2 since it is now a standard rather than a recommended practice.

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 21 17:18:20 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9274-NFPA 70-2024
Statement: Servicing and maintenance is retained in this section as it is covered in this Code per 90.2(C) [see FR-9273]. The servicing and maintenance requirements differentiate it from reconditioning.

Public Input No. 89-NFPA 70-2023 [New Section after 110.21]

ADD a section to 110.21(A) Equipment Marking

110.21(A)(3) Working Space. Electrical equipment shall clearly be marked with the working space in accordance with table 110.26(A)(1) working spaces and in accordance with 110.26(B) for working space not used as storage.

Example: 100A Panelboard in a cabinet in a hall/passage way, or a 100A panelboard in a cabinet in the back house of a restaurant. The equipment shall be clearly marked with the working space in accordance with table 110.26(A)(1).

I hope this reduces the amount of people blocking the working spaces, using the spaces for storage and could prevent someone from initiating a circuit breaker or servicing the equipment. A clear marking on the electrical equipment would defer people from using the space as storage.

Statement of Problem and Substantiation for Public Input

The problem that would be fixed would be people using the working space around electrical equipment as storage space. The markings would reduce the amount of violations and bring awareness to people that this is not to be used as storage space in accordance with 110.26(B),

Submitter Information Verification

Submitter Full Name: Ben Olson
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 10 21:54:15 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The working space is covered in current requirement in Section 110.26. The facility is responsible for clear workspace. The marking requirement is outside the installation requirement of equipment

Public Input No. 467-NFPA 70-2023 [Section No. 110.21(A)(1)]

(1) General.

The manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product can be identified shall be applied or affixed onto all electrical equipment. Other markings that indicate voltage, current, wattage, or other ratings shall be provided as specified elsewhere in this *Code*. The marking shall be of sufficient durability to withstand the environment involved and shall be visible for inspection and application of the requirements in this Code .

Statement of Problem and Substantiation for Public Input

Equipment is often installed in the field in a manner where the nameplate information is not accessible or visible for inspection or application of important NEC rules that address nameplate values. As an example, HVAC equipment installed with the nameplate up against a wall other obstacle, impeding its use and visibility. The revision will assist installers and maintainers in attaining Code compliance where this situation creates field problems. Nameplate information is also critical for proper Code application during installation, but also for servicing and maintaining equipment after installation.

Submitter Information Verification

Submitter Full Name: Mark Earley
Organization: Alumni Code Consulting
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 15 12:59:32 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The submitter's use of the term "visible" is not clearly understood. For example, equipment requiring marking and installed in an enclosure may or may not be considered "visible." The location of the equipment marking is governed by the product standards. The manufacturer cannot assume or control the orientation for the installation of the equipment.

Public Input No. 3056-NFPA 70-2023 [Section No. 110.21(B)]

(B) Field-Applied Hazard Markings.

Where caution, warning, or danger hazard markings such as labels or signs are required by this *Code*, the markings shall meet the following requirements:

(1) The marking shall be of sufficient durability to withstand the environment involved and warn of the hazards using effective words, colors, symbols, or any combination thereof.

Informational Note No. 1: See ANSI Z535.2-2011 (R2017), *Environmental and Facility Safety Signs*, which describes the design, application, and use of safety signs in facilities and in the environment.

Informational Note No. 2: See ANSI Z535.4-2011 (R2017), *Product Safety Signs and Labels*, which details the design, application, use, and placement of safety signs and labels on a wide variety of products.

(2) The marking shall be permanently affixed to the equipment or wiring method and shall not be handwritten.

Exception to (2): Portions of the markings that are variable, or that could be subject to changes, shall be permitted to be handwritten and shall be legible.

3. The markings shall be legible and permanent. The title text shall be a minimum of 6-mm (¼-in.) high letters and body text shall be a minimum of 3-mm (⅛-in.) high letters on a contrasting background .

Statement of Problem and Substantiation for Public Input

Giving a minimum size is very important for the safety of the electrical worker. The text is extracted from 690.12(D).

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:48:12 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Adequate guidance is already provided in the current Informational Notes. Caution and hazard markings are not required to be text only, they can be pictograms.

Public Input No. 1121-NFPA 70-2023 [Section No. 110.22(A)]

(A) General.

Each disconnecting means shall be legibly marked to indicate its purpose ~~unless located~~ and ~~arranged so the purpose is evident. In other than one- or two-family dwellings, the marking shall include the identification and location of the~~ circuit source ~~that supplies the disconnecting means~~ unless located and arranged so the ~~identification~~ purpose and ~~location of the circuit~~ source is evident. ~~The~~ The marking shall ~~be of sufficient durability to withstand the environment involved.~~ meet the requirements in 110.21(B).

Statement of Problem and Substantiation for Public Input

The modification of this article will require all disconnecting means to be marked to indicate not only its purpose but its circuit source (circuit number) which is not always evident , even in a one- and two-family dwelling where multiple panels and/or circuits are in the structure.

Submitter Information Verification

Submitter Full Name: Greg Chontow
Organization: Boro of Hopatcong
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jun 18 11:35:22 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9147-NFPA 70-2024
Statement: The revision clarifies the marking requirements for disconnects and references 110.21(B) and marking criteria for the environment and field applied label. Adequate guidance for text format is already provided in the current informational notes in Section 110.21(B).

Public Input No. 179-NFPA 70-2023 [Section No. 110.22(A)]

(A) General.

Each disconnecting means shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident. The marking shall be of sufficient durability to withstand the environment involved.

(1) In other than one- or two-family dwellings, the marking shall include the identification and location of the circuit source that supplies the disconnecting means unless located and arranged so the identification and location of the circuit source is evident. ~~The marking shall be of sufficient durability to withstand the environment involved.~~

Statement of Problem and Substantiation for Public Input

This is an editorial change with no technical change. Having the location marking requirement in its own second level subdivision will improve clarity.

Submitter Information Verification

Submitter Full Name: Don Ganiere
Organization: none
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 17 13:16:18 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9147-NFPA 70-2024
Statement: The revision clarifies the marking requirements for disconnects and references 110.21(B) and marking criteria for the environment and field applied label. Adequate guidance for text format is already provided in the current informational notes in Section 110.21(B).

Public Input No. 3057-NFPA 70-2023 [Section No. 110.22(A)]

(A) General.

Each disconnecting means shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident. In other than one- or two-family dwellings, the marking shall include the identification and location of the circuit source that supplies the disconnecting means unless located and arranged so the identification and location of the circuit source is evident. The marking shall be of sufficient durability to withstand the environment involved.

The markings shall be legible and permanent, comply with 110.21 (B), and the text shall be a minimum of 6-mm (¼-in.) high letters and body text a minimum of 3-mm (⅛-in.) high letters on a contrasting background.

Statement of Problem and Substantiation for Public Input

Giving a minimum size is very important for the safety of the electrical worker. The text is extracted from 690.12(D).

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:50:05 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9147-NFPA 70-2024
Statement: The revision clarifies the marking requirements for disconnects and references 110.21(B) and marking criteria for the environment and field applied label. Adequate guidance for text format is already provided in the current informational notes in Section 110.21(B).

Public Input No. 69-NFPA 70-2023 [Section No. 110.24]

110.24 Available Fault Current.

(A) Field Marking.

Service equipment at other than dwelling units shall be legibly marked in the field with the available fault current. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved. The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.

Informational Note No.

~~1: See NFPA *70E* 2021, *Standard for Electrical Safety in the Workplace,* for assistance in determining the severity of potential exposure, planning safe work practices, and selecting personal protective equipment.~~

1: The available fault-current marking(s) addressed in 110.24

~~is~~

are related to required short-circuit current and interrupting ratings of equipment. See 110.16 for other requirements related to personnel safety when performing justified energized electrical work.

Informational Note No.

~~2~~

2 : Values of available fault current for use in determining appropriate minimum short-circuit current and interrupting ratings of service equipment are available from electric utilities in published or other forms.

(B) Modifications.

When modifications to the electrical installation occur that affect the available fault current at the service, the available fault current shall be verified or recalculated as necessary to ensure the service equipment ratings are sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) in 110.24(A) shall be adjusted to reflect the new level of available fault current.

Exception: The field marking requirements in 110.24(A) and 110.24(B) shall not be required in industrial installations where conditions of maintenance and supervision ensure that only qualified persons service the equipment.

Statement of Problem and Substantiation for Public Input

Despite any markups caused by TerraView, this PI seeks only to modify informational note 1 to 110.24A.

Submitter believes that the 2023 revision (which adds the note about NFPA 70E) makes it more ambiguous than it previously was, that 110.24 is concerning equipment design (i.e.: ensuring proper interrupting ratings are selected for additions to the equipment) while 110.16 is concerning personnel safety practices while performing justified energized work (to include the "energized" work of verifying a de-energized condition).

The only published substantiation for the 2023 revision was style manual and this PI seeks mostly to revert to 2020 language. Style manual should not take precedence over clarity.

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 07 17:47:48 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9157-NFPA 70-2024

Statement: The reference to NFPA 70E is deleted because it is applicable to work practices and not equipment ratings. The redundant language related to the marking was removed and replaced with a cross-reference to 110.21(B). Adequate guidance for text format is already provided in the current informational notes in Section 110.21(B).

Public Input No. 776-NFPA 70-2023 [Section No. 110.24]

110.24 Available Fault Current.

(A) Field Marking.

~~Service equipment at other than~~ Switchboards, switchgear, panelboards, and service equipment at other than one and two family dwelling units shall be legibly marked in the field with the available fault current. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved. The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.

Informational Note No. 1: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace,* for assistance in determining the severity of potential exposure, planning safe work practices, and selecting personal protective equipment. The available fault-current marking(s) addressed in 110.24 is related to required short-circuit current and interrupting ratings of equipment.

Informational Note No. 2: Values of available fault current for use in determining appropriate minimum short-circuit current and interrupting ratings of service equipment are available from electric utilities in published or other forms.

(B) Modifications.

When modifications to the electrical installation occur that affect the available fault current at the ~~service~~ equipment , the available fault current shall be verified or recalculated as necessary to ensure ~~the service equipment~~ the equipment ratings are sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) in 110.24(A) shall be adjusted to reflect the new level of available fault current.

Exception: The field marking requirements in 110.24(A) and 110.24(B) shall not be required in industrial installations where conditions of maintenance and supervision ensure that only qualified persons service the equipment.

Statement of Problem and Substantiation for Public Input

This is a companion PI to one recommending the deletion of section 408.6. 408.6 requires the marking of "Switchboards, switchgear, and panelboards in other than one or two family dwellings." Combining these two sections puts the requirements in one place. It also addresses conflicts between the two. 110 refers to services in non-dwellings only but 408 refers to all switchboards, switchgear, and panelboards in other than one or two family dwellings. 110 has an exception for industrial locations but 408 has no such exception.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 775-NFPA 70-2023 [Section No. 408.6]	Move the requirements of 408.6 to 110.24

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 07 11:42:18 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Current language addresses the appropriate equipment to be marked as a general requirement.

Public Input No. 245-NFPA 70-2023 [Section No. 110.24(A)]

(A) Field Marking.

Service equipment ~~at other than dwelling units~~ shall be legibly marked in the field with the available fault current. In other than dwelling units the available fault current shall be marked on electrical equipment, such as switchboards, switchgear, panelboards, industrial control panels, motor control centers, disconnects, and is likely to require examination, adjustment, serving, or maintenance while energized. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved. The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.

Exception No. 1: When documentation is provided showing available fault current is 5K amperes, or less, at the electrical equipment supply power source.

Informational Note No. 1: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace,* for assistance in determining the severity of potential exposure, planning safe work practices, and selecting personal protective equipment. The available fault-current marking(s) addressed in 110.24 is related to required short-circuit current and interrupting ratings of equipment.

Informational Note No. 2: Values of available fault current for use in determining appropriate minimum short-circuit current and interrupting ratings of service equipment are available from electric utilities in published or other forms.

Statement of Problem and Substantiation for Public Input

An increasing number of dwelling unit services are exceeding 10K amperes of available fault current from serving utilities increasing the serving transformers. Most of the shelf main breaker panelboards are rated 10K amperes interrupting capacity. Many commercial buildings have AFC at the roof level above 10K amperes. Most HVAC equipment, elevator equipment have an AIC rating 10K AIC or less. By marking this equipment it will give those examining, maintaining, servicing better information and promote the basis of the the NEC 90.1(A).

Submitter Information Verification

Submitter Full Name: Robert Nakamichi
Organization: City of Seattle
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 28 20:01:30 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Current language addresses the appropriate equipment to be marked as a general requirement.

Public Input No. 3058-NFPA 70-2023 [Section No. 110.24(A)]

(A) Field Marking.

Service equipment at other than dwelling units shall be legibly marked in the field with the available fault current. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved. The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.

The markings shall be legible and permanent, comply with 110.21 (B), and the text shall be a minimum of 6-mm (¼-in.) high letters and body text a minimum of 3-mm (⅛-in.) high letters on a contrasting background.

Informational Note No. 1: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace,* for assistance in determining the severity of potential exposure, planning safe work practices, and selecting personal protective equipment. The available fault-current marking(s) addressed in 110.24 is related to required short-circuit current and interrupting ratings of equipment.

Informational Note No. 2: Values of available fault current for use in determining appropriate minimum short-circuit current and interrupting ratings of service equipment are available from electric utilities in published or other forms.

Statement of Problem and Substantiation for Public Input

Giving a minimum size is very important for the safety of the electrical worker. The text is extracted from 690.12(D).

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:51:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9157-NFPA 70-2024
Statement: The reference to NFPA 70E is deleted because it is applicable to work practices and not equipment ratings. The redundant language related to the marking was removed and replaced with a cross-reference to 110.21(B). Adequate guidance for text format is already provided in the current informational notes in Section 110.21(B).

Public Input No. 3198-NFPA 70-2023 [Section No. 110.24(B)]

(B) Modifications.

When modifications to the electrical ~~installation~~ system occur that affect the available fault current at the service, the available fault current shall be verified or recalculated as necessary to ensure the service equipment ratings are sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) in 110.24(A) shall be adjusted to reflect the new level of available fault current.

Exception: The field marking requirements in 110.24(A) and 110.24(B) shall not be required in industrial installations where conditions of maintenance and supervision ensure that only qualified persons service the equipment.

Statement of Problem and Substantiation for Public Input

The use of the word “installation” implies the scope of changes is limited to only the conductors and equipment that the owner has installed. However, one of the most common changes that affect the available fault current is at the utility transformer. Using the word “system” instead of “installation” will ensure the Code includes any changes like this within its scope for when the available fault current shall be recalculated.

Submitter Information Verification

Submitter Full Name: Christy McElhinny
Organization: Eaton Bussmann
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 30 10:33:10 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The change to the system by the utility cannot be addressed in the original installation. The submitter has not adequately substantiated that changing the word “installation” to “system” will “ensure the Code includes any changes like this” as described in the recommendation.

Public Input No. 2159-NFPA 70-2023 [Section No. 110.26(A)]

(A) Working Space.

Working space for equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions of 110.26(A)(1), (A)(2), (A)(3), and (A)(4) or as required or permitted elsewhere in this *Code*. By Special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

Informational Note: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for guidance, such as determining severity of potential exposure, planning safe work practices including establishing an electrically safe work condition, arc flash labeling, and selecting personal protective equipment.

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) ~~*Low Voltage.* By special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.~~

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

(2) Width of Working Space.

The width of the working space in front of the electrical equipment shall be the width of the equipment or 762 mm (30 in.), whichever is greater. In all cases, the work space shall permit at least a 90-degree opening of equipment doors or hinged panels.

(3) Height of Working Space.

The work space shall be clear and extend from the grade, floor, or platform to a height of 2.0 m (6½ ft) or the height of the equipment, whichever is greater. Within the height requirements of this section, other equipment or support structures, such as concrete pads, associated with the electrical installation and located above or below the electrical equipment shall be permitted to extend not more than 150 mm (6 in.) beyond the front of the electrical equipment.

Exception No. 1: On battery systems mounted on open racks, the top clearance shall comply with 480.10(D).

Exception No. 2: In existing dwelling units, service equipment or enclosed panelboards that do not exceed 200 amperes shall be permitted in spaces where the height of the working space is less than 2.0 m (6½ ft).

Exception No. 3: Meters that are installed in meter sockets shall be permitted to extend beyond the other equipment. The meter socket shall be required to follow the rules of this section.

(4) Limited Access.

Where equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized is required by installation instructions or function to be located in a space with limited access, all of the following shall apply:

(1) Where equipment is installed above a lay-in ceiling, there shall be an opening not smaller than 559 mm × 559 mm (22 in. × 22 in.), or in a crawl space, there shall be an accessible opening not smaller than 559 mm × 762 mm (22 in. × 30 in.).

(2) The width of the working space shall be the width of the equipment enclosure or a minimum of 762 mm (30 in.), whichever is greater.

(3) All enclosure doors or hinged panels shall be capable of opening a minimum of 90 degrees.

(4) The space in front of the enclosure shall comply with the depth requirements of Table 110.26(A)(1) and shall be unobstructed to the floor by fixed cabinets, walls, or partitions. Space reductions in accordance with 110.26(A)(1)(b) shall be permitted. The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in this space provided the location of weight-bearing structural members does not result in a side reach of more than 150 mm (6 in.) to work within the enclosure.

(5) Separation from High-Voltage Equipment.

Where switches, cutouts, or other equipment operating at 1000 volts, nominal, or less are installed in a vault, room, or enclosure where there are exposed live parts or exposed wiring operating over 1000 volts, nominal, the high-voltage equipment shall be effectively separated from the space occupied by the low-voltage equipment by a suitable partition, fence, screen.

(6) Grade, Floor, or Working Platform.

The grade, floor, or platform in the required working space shall be kept clear, and the floor, grade, or platform in the working space shall be as level and flat as practical for the entire required depth and width of the working space.

Statement of Problem and Substantiation for Public Input

The intent of this PI is to move the language of the low voltage permission to the parent text. Currently, the allowance for the AHJ to reduce working space is only in the depth section. The allowance to reduce working spaces should also apply to width and height. If it is the intent of the Code panel to restrict this allowance to depth only, perhaps the allowance should be reworded as "By special permission, a shallower depth shall be permitted where..."

Submitter Information Verification

Submitter Full Name: Eric Stromberg
Organization: Los Alamos National Laboratory
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 13 22:22:28 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Special permission is permitted per NEC 90.4. Inadequate technical substantiation is provided to expand the scope of the safe work distances per the Regulations Governing the Development of NFPA Standards 4.3.4.1(d) and 4.3.4.2.

Public Input No. 2038-NFPA 70-2023 [Section No. 110.26(A)(1)]

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) *Low Voltage.* By special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

(d) Modular Meter Centers & Meter-Disconnects. Where equipment contains meter sockets, the working space depth shall be measured from the face of the enclosure, not from the meter itself.

(e) Equipment Sections without operable components. Where electrical equipment contains sections that have no serviceable or operable parts, working clearance shall not be required for these sections.

Additional Proposed Changes

File Name	Description	Approved
E-111C.pdf	Example of building section with interior closet style meter centers installed with inside corners and elbows behind wall sections.	

Statement of Problem and Substantiation for Public Input

There is often disagreement between installers and AHJs on providing adequate clearance at meter centers.
(d) The AHJ inspects the gear at the time of installation and measures the depth of the working space to be compliant. Afterwards, the utility company inserts their meters into the socket. Residential meters can protrude from the meter socket 6"-8" while some commercial meters can extend 12" or more. The ambiguity in the code often leads to disagreements and challenges at final inspection that were not addressed and present with the gear was originally inspected at rough-in / pre-energization inspections. The language proposed adds clarity to the depth of working space and resolves the point of contention when measuring and enforcing the required minimum depth of working space.
(e) Switchboards often contain pull sections or tap sections. Meter centers may contain also contain blank bussed

sections and elbows (inside and outside corners). These sections do not contain any serviceable components, and once installed there is no need for inspection, operation, or maintenance. Working space should not be required for these sections of equipment. There are electric room layouts where space is tight and requiring working space for blank sections without serviceable parts this can make the installation not feasible.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2090-NFPA 70-2023 [Section No. 110.26(C)(2)]	

Submitter Information Verification

Submitter Full Name: Josh Wiley
Organization: Jordan Skala Engineers
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 11 11:08:34 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Regarding proposed (d), meter socket enclosures are not likely to require examination, adjustment, servicing, or maintenance while energized. Accordingly, per 110.26(A), 110.26(A)(1) is not applicable. Further, per the proposed (e), electrical equipment containing sections that have no serviceable or operable parts are not likely to require examination, adjustment, servicing, or maintenance while energized. Accordingly, per 110.26(A), 110.26(A)(1) is not applicable.

Public Input No. 207-NFPA 70-2023 [Section No. 110.26(A)(1)]

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) *Low Voltage.* By special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

Exception: The distance in front of the equipment shall be permitted to be reduced to a lesser distance for a period of 90 days when installing new equipment in a space where existing equipment is already installed that will be removed when the new equipment is energized. The clearance distances in front of the new equipment shall meet the requirements of 110.26.

Statement of Problem and Substantiation for Public Input

There are occasions when new equipment needs to be installed in a location and the existing equipment must remain in service until the new equipment is installed and energized before the existing equipment can be demolished and removed. During this period it may be impossible to meet the clearance requirements of 110.26 until the existing equipment is removed.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 20 16:29:04 EST 2023

Committee: NEC-P01

Committee Statement

Resolution: The proposed revision would reduce safety when servicing existing equipment. There is inadequate technical substantiation to warrant this change.Inconvenience is not recognized as substantiation to dilute a safety requirement.

Public Input No. 215-NFPA 70-2023 [Section No. 110.26(A)(1)]

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal ~~Voltage to Ground~~ Voltage	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
~~0–150~~ 0–250	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
~~151–600~~ 251–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) *Low Voltage.* By special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

Statement of Problem and Substantiation for Public Input

Prior to 2017 NEC Code the table had two rows for voltages that covered nominal voltages to ground from 0 to 600V which covered all nominal voltages from 0 to 1000V. The table in the 2017 NEC Code had a 3rd line adding for 601 - 1000V which than placed this line of the table outside Part II of the article. 1000V nominal to ground would be 1730 / 2000V (3P/1P). If the nominal voltage between 601 and 1000V is to require a larger working clearance, then the table would need to be based off nominal voltages.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 210-NFPA 70-2023 [Section No. 110.26(A)(4)]	Same issue of Nominal Voltage to Ground

Submitter Information Verification

Submitter Full Name: Robert Nakamichi
Organization: City of Seattle

Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 23 11:02:27 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Inadequate technical substantiation to warrant this change has been provided. This change would decrease the safety factor by increasing the voltage to allow for a reduced minimum clear distance.

Public Input No. 2385-NFPA 70-2023 [Section No. 110.26(A)(1)]

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed live parts on one side of the working space and grounded or conductive parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) *Low Voltage.* By special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

Statement of Problem and Substantiation for Public Input

Adding the word ‘conductive’ for installation scenarios where a panelboard is installed in front of a metal surface that isn’t grounded but is conductive and poses the same hazard. For example, many warehouses install metal guards in front of panelboards to prevent forklifts from causing physical damage. This metal guard isn’t grounded but should meet condition 2 working space requirements.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 15:47:17 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: A conductive surface does not necessarily complete a circuit due to it not being grounded or energized

Public Input No. 42-NFPA 70-2023 [Section No. 110.26(A)(1)]

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the ~~exposed~~ live parts, if such are exposed; or from the enclosure front or opening, if ~~the live parts~~ such are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) *Low Voltage.* By special permission, smaller working spaces shall be permitted where all exposed live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

Statement of Problem and Substantiation for Public Input

The wording of this can needlessly lead to the misinterpretation that in an installation with enclosed live parts (most low voltage installations) the "or" means that one can either measure from the cover or measure from the actual parts. Section 110.34A deals with working space for medium to high voltage equipment and is worded differently and in a manner that does not invite this needless confusion. The change proposed adopts the language from section 110.34A. With the similarity in reasons for the rules of 110.26A and 110.34A, it would seem prudent to maintain the same language at both locations to the extent possible.

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 04 16:22:53 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9207-NFPA 70-2024

Statement: Correlates with similar requirements of 110.34(A) and improves clarity. This revision logically accounts for the fact that enclosed equipment will need to meet the distances in each condition when equipment that is enclosed becomes exposed.

Public Input No. 504-NFPA 70-2023 [Section No. 110.26(A)(1)]

(1) Depth of Working Space.

The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (A)(1)(b), or (A)(1)(c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed or enclosed live parts on one side of the working space and no exposed or enclosed live or grounded parts on the other side of the working space, or exposed or enclosed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed or enclosed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed or enclosed live parts on both sides of the working space.

(a) *Dead-Front Assemblies.* Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards, switchgear, or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) *Low Voltage.* By special permission, smaller working spaces shall be permitted where ~~all exposed~~ all live parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) *Existing Buildings.* In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, switchgear, enclosed panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

Statement of Problem and Substantiation for Public Input

Using the sole term exposed creates confusion when interpreting this code section. Most electrical equipment is guarded by an enclosure and therefore not Exposed.

Considering Conditions 1-3
Without this change simply using the term exposed, one can argue you do not need to meet these clear distances for panelboards within a cabinet

Submitter Information Verification

Submitter Full Name: Donald Fess
Organization:
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 22 12:13:59 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9207-NFPA 70-2024

Statement: Correlates with similar requirements of 110.34(A) and improves clarity. This revision logically accounts for the fact that enclosed equipment will need to meet the distances in each condition when equipment that is enclosed becomes exposed.

Public Input No. 2437-NFPA 70-2023 [Section No. 110.26(A)(2)]

(2) Width of Working Space.

The width of the working space in front of the electrical equipment shall be the width of the equipment or 762 mm (30 in.), whichever is greater. In all ~~cases, the work space shall permit~~ cases the equipment with door(s) shall open at least a 90-~~degree opening of equipment doors or hinged panels~~ degrees .

Statement of Problem and Substantiation for Public Input

The way it is written now the equipment would be allowed to not open 90 degrees or more, just the workspace has to allow it to open 90 degrees. I realize a lot of the UL standards do require the equipment to open 90 degrees but there is places that do not.

Submitter Information Verification

Submitter Full Name: Jonathan Sunde
Organization: Trystar
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 10:58:15 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: 110.26(A)(2) only addresses the width of the working space. Inadequate technical substantiation was provided per the Regulations Governing the Development of NFPA Standards 4.3.4.1(d) and 4.3.4.2.

Public Input No. 210-NFPA 70-2023 [Section No. 110.26(A)(4)]

(4) Limited Access.

Where equipment operating at 1000 volts, nominal, or less ~~to ground~~ and likely to require examination, adjustment, servicing, or maintenance while energized is required by installation instructions or function to be located in a space with limited access, all of the following shall apply:

(1) Where equipment is installed above a lay-in ceiling, there shall be an opening not smaller than 559 mm × 559 mm (22 in. × 22 in.), or in a crawl space, there shall be an accessible opening not smaller than 559 mm × 762 mm (22 in. × 30 in.).

(2) The width of the working space shall be the width of the equipment enclosure or a minimum of 762 mm (30 in.), whichever is greater.

(3) All enclosure doors or hinged panels shall be capable of opening a minimum of 90 degrees.

(4) The space in front of the enclosure shall comply with the depth requirements of Table 110.26(A)(1) and shall be unobstructed to the floor by fixed cabinets, walls, or partitions. Space reductions in accordance with 110.26(A)(1)(b) shall be permitted. The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in this space provided the location of weight-bearing structural members does not result in a side reach of more than 150 mm (6 in.) to work within the enclosure.

Statement of Problem and Substantiation for Public Input

This issue of the statement "to ground" has caused interpretation issues since the 2017 code.
These located in Part II 1000 Volts, Nominal, or less. By having the statement "to ground" would place voltages outside this Part of ther article.
1000V nominal to ground would require a nominal voltage (Phase to phase) of approximately 1730V placing the nominal voltage outside Part II.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 215-NFPA 70-2023 [Section No. 110.26(A)(1)]	

Submitter Information Verification

Submitter Full Name: Robert Nakamichi
Organization: City of Seattle
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 21 13:19:43 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9213-NFPA 70-2024
Statement: Sections of Article 110 have been revised to clarify the voltage rating of “not over 1000 volts ac, 1500 volts dc, nominal” where a voltage range is indicated. Voltage range was deleted in the body of the text where not necessary due to the title of the Part of the Article.

Public Input No. 3297-NFPA 70-2023 [Section No. 110.26(A)(4)]

(4) Limited Access.

Where equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized is required by installation instructions or function to be located in a space with limited access, all of the following shall apply:

(1) Where equipment is installed above a suspended ceiling (lay-in ~~ceiling~~ or solid surface) , there shall be an opening not smaller than 559 mm × 559 mm (22 in. × 22 in.), or in a crawl space, there shall be an accessible opening not smaller than 559 mm × 762 mm (22 in. × 30 in.).

(2) The width of the working space shall be the width of the equipment enclosure or a minimum of 762 mm (30 in.), whichever is greater.

(3) All enclosure doors or hinged panels shall be capable of opening a minimum of 90 degrees.

(4) The space in front of the enclosure shall comply with the depth requirements of Table 110.26(A)(1) and shall be unobstructed to the floor by fixed cabinets, walls, or partitions. Space reductions in accordance with 110.26(A)(1)(b) shall be permitted. The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in this space provided the location of weight-bearing structural members does not result in a side reach of more than 150 mm (6 in.) to work within the enclosure.

Additional Proposed Changes

File Name	Description	Approved
PC_1521_CMP_1.pdf	NEC_PC1521	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 1521 of the (A2022) Second Draft Report for NFPA 70 and per the Regs. at 4.4.8.3.1.

Substantiation: This comment is being submitted on behalf of the Minnesota Department of Labor and Industry. The Department’s 15 office/field staff, and 70 contract electrical inspectors complete over 150,000 electrical inspections annually.

This comment will clarify which type(s) of suspended ceilings must comply with the dimensions of (1). Currently, the language only applies to lay-in ceilings. This simple clarification to FR 8637 in (1) would help AHJs to enforce the limited access requirements consistently for all types of suspended ceilings.

Submitter Information Verification

Submitter Full Name: CMP ON NEC-P01
Organization: Code-Making Panel 1
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 31 16:54:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Adding solid surface as a type of suspended ceiling could create confusion as this term is not defined.

Public Comment No. 1521-NFPA 70-2021 [Section No. 110.26(A)(4)]

(4) Limited Access.

Where equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized is required by installation instructions or function to be located in a space with limited access, all of the following shall apply:

(1) Where equipment is installed above a suspended ceiling (lay-in ~~ceiling~~ or solid surface) , there shall be an opening not smaller than 559 mm × 559 mm (22 in. × 22 in.), or in a crawl space, there shall be an accessible opening not smaller than 559 mm × 762 mm (22 in. × 30 in.).

(2) The width of the working space shall be the width of the equipment enclosure or a minimum of 762 mm (30 in.), whichever is greater.

(3) All enclosure doors or hinged panels shall be capable of opening a minimum of 90 degrees.

(4) The space in front of the enclosure shall comply with the depth requirements of Table 110.26(A)(1) and shall be unobstructed to the floor by fixed cabinets, walls, or partitions. Space reductions in accordance with 110.26(A)(1)(b) shall be permitted. The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in this space provided the location of weight-bearing structural members does not result in a side reach of more than 150 mm (6 in.) to work within the enclosure.

Statement of Problem and Substantiation for Public Comment

This comment is being submitted on behalf of the Minnesota Department of Labor and Industry. The Department's 15 office/field staff, and 70 contract electrical inspectors complete over 150,000 electrical inspections annually.

This comment will clarify which type(s) of suspended ceilings must comply with the dimensions of (1). Currently, the language only applies to lay-in ceilings. This simple clarification to FR 8637 in (1) would help AHJs to enforce the limited access requirements consistently for all types of suspended ceilings.

Related Item

• FR 8637

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 16 09:46:57 EDT 2021
Committee: NEC-P01

Committee Statement

Committee Rejected but held

Action:

Resolution: The submitter has proposed content that has not received public review. This PC does not comply with the Regulations Governing the Development of NFPA Standards, Section 4.4.4.2. Public comments must be related to material that has received public review.

Public Input No. 4300-NFPA 70-2023 [Section No. 110.26(A)(4)]

(4) Limited Access.

Where equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized is required by installation instructions or function to be located in a space with limited access, all of the following shall apply:

(1) Where equipment is installed above a lay-in ceiling, there shall be an opening not smaller than 559 mm × 559 mm (22 in. × 22 in.), or in a crawl space, there shall be an accessible opening not smaller than 559 mm × 762 mm (22 in. × 30 in.).

(2) The ~~width of the working~~

(3) space ~~shall be the width of the equipment enclosure or a minimum of 762 mm (30 in.), whichever is greater.~~

(4) ~~All enclosure doors or hinged panels shall be capable of opening a minimum of 90 degrees.~~

(5) ~~The space~~ in front of the enclosure shall ~~comply with the depth requirements of Table 110.26(A)(1) and shall~~ be unobstructed to the floor by fixed cabinets, walls, or partitions. Space reductions in accordance with 110.26(A)(1)(b) shall be permitted. The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in this space provided the location of weight-bearing structural members does not result in a side reach of more than 150 mm (6 in.) to work within the enclosure.

Statement of Problem and Substantiation for Public Input

The opening statement in 110.26(A) states the working space must comply with (A)(1), (A)(2), (A)(3), and (A)(4). Deleting redundant requirement in (A)(4) about 30 in width, doors opening 90 degrees, and complying with the depth in Table 110.26(A)(1). This proposed revision will improve redundancy for Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 10:19:13 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Adequate technical substantiation is not provided per the Regulations Governing the Development of NFPA Standards 4.3.4.1(d) and 4.3.4.2.

Public Input No. 350-NFPA 70-2023 [Section No. 110.26(A)(6)]

(6) Grade, Floor, or Working Platform.

The grade, floor, or platform in the required working space shall be kept clear, and the floor, grade, or platform in the working space shall be as level and flat as practical for the entire required depth and width of the working space.

Exception 1: Raised support structures (such as concrete pads) extending horizontally to a distance of 6" or more beyond the base of the equipment shall be permitted to be no more than 6" higher than the adjoining grade which may be within the required working space; provided all egress heights required by other sections of this code are met when measured from the lowest grade present within the working space.

Exception 2: Raised support structures (such as concrete pads) extending horizontally to a distance of no more than 6" beyond the base of the equipment shall be permitted extend any vertical distance above the adjoining grade which may be within the required working space; provided all vertical distances required by this code are met when measured from the lowest point withing the working space.

Informational Note to Exceptions 1 & 2: See 240.24 and 404.8 for examples of minimum vertical distances that must be measured from the lowest point within the working space.

Statement of Problem and Substantiation for Public Input

NEC 2023 is only recently published and in many cases not adopted. Thus, there is at the time of this submission limited documentation in the form of failed inspections or such that can be used as substantiation.

However, this new section may have unintended effects such as needlessly making elevation of concrete structures above local grade (a good practice to avoid water intrusion in both indoor and outdoor installations) more difficult. It may require equipment pads to be much wider to maintain a totally plane working space; or it may result in a change to the commonly accepted (but not always required) practice of raising equipment pads above surface grade. This PI seeks to provide a provision to allow equipment pads to extend vertically to a limited distance without creating potential code compliance conflicts.

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sun Feb 19 09:47:35 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Equipment pads within the working space are addressed in 110.26(A)(3).

Public Input No. 351-NFPA 70-2023 [Section No. 110.26(A)(6)]

(6) Grade, Floor, or Working Platform.

The grade, floor, or platform in the required working space shall be kept clear ~~,~~ and ~~the floor, grade, or platform in the working space~~ shall be as level and flat as practical for the entire required depth and width of the working space.

Statement of Problem and Substantiation for Public Input

This submitter believes this change will make it easier to read and interpret Removes duplicate language.

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Sun Feb 19 10:27:24 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9209-NFPA 70-2024
Statement: Deleting “the floor, grade, or platform in the working space shall be” eliminates redundant language and increases clarity.

Public Input No. 1088-NFPA 70-2023 [Section No. 110.26(A) [Excluding any Sub-Sections]]

Working space for equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions of 110.26(A)(1), (A)(2), (A)(3), and (A)(4) or as required or permitted elsewhere in this *Code*.

Informational Note: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for guidance, such as determining severity of potential exposure, planning safe work practices including establishing an electrically safe work condition, arc flash labeling, and selecting personal protective equipment.

Informational Note: Typical 1000V and lower transformer installations are not considered to require examination, adjustment, servicing, or maintenance while energized.

Statement of Problem and Substantiation for Public Input

There is a lack of clarity in the industry if transformers are required to have working clearances or not. This needs to be clarified to avoid construction delays and potential safety issues.

Submitter Information Verification

Submitter Full Name: Eric Putnam
Organization:
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 17:56:36 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Per the NEC Style Manual 2.1.10.2, informational notes shall not make interpretations. A transformer, regardless of voltage or KVA rating, is electrical equipment and requires adequate working space and is likely to require examination, adjustment, servicing, or maintenance while energized.

Public Input No. 1089-NFPA 70-2023 [Section No. 110.26(A) [Excluding any Sub-Sections]]

Working space for equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions of 110.26(A)(1), (A)(2), (A)(3), and (A)(4) or as required or permitted elsewhere in this *Code*.

Informational Note: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for guidance, such as determining severity of potential exposure, planning safe work practices including establishing an electrically safe work condition, arc flash labeling, and selecting personal protective equipment.

Informational Note: Transformers larger than 3kVA are considered e quipment likely to require examination, adjustment, servicing, or maintenance while energized.

Statement of Problem and Substantiation for Public Input

There is a lack of clarity in the industry as to whether transformers are to be included in the requirements of 110.26. Resolving this would avoid construction delays and potential safety issues.

Submitter Information Verification

Submitter Full Name: Eric Putnam
Organization:
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 18:01:34 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Per the NEC Style Manual 2.1.10.2, informational notes shall not make interpretations. A transformer, regardless of voltage or KVA rating, is electrical equipment and requires adequate working space and is likely to require examination, adjustment, servicing, or maintenance while energized.

Public Input No. 3757-NFPA 70-2023 [Section No. 110.26(A) [Excluding any Sub-Sections]]

Working space for equipment operating at 1000 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions of 110.26(A)(1), (A)(2), (A)(3), and (A)(4) or as required or permitted elsewhere in this *Code*. These dimensions shall also apply to switch gear, motor control centers or panelboards installed inside of an enclosure.

Informational Note: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for guidance, such as determining severity of potential exposure, planning safe work practices including establishing an electrically safe work condition, arc flash labeling, and selecting personal protective equipment.

Statement of Problem and Substantiation for Public Input

Manufactures of switchgear, MCCC's and panelboards also provide enclosures for these types of equipment. Many times the enclosures do not have the working space in front of the equipment which presents a safety concern to the maintenance staff.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 15:30:21 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Inadequate technical substantiation was provided per the Regulations Governing the Development of NFPA Standards 4.3.4.1(d) and 4.3.4.2.

Public Input No. 4453-NFPA 70-2023 [Section No. 110.26(A) [Excluding any Sub-Sections]]

Working space for equipment operating at 1000 volts, nominal, or less to ground and likely to be energized and require examination, adjustment, servicing, or maintenance ~~while energized~~ shall comply with the dimensions of 110.26(A)(1), (A)(2), (A)(3), and (A)(4) or as required or permitted elsewhere in this *Code*.

Informational Note: See NFPA *70E*-2021, *Standard for Electrical Safety in the Workplace*, for guidance, such as determining severity of potential exposure, planning safe work practices including establishing an electrically safe work condition, arc flash labeling, and selecting personal protective equipment.

Statement of Problem and Substantiation for Public Input

Revising the text in 110.26(A) to make the requirements apply even if the equipment is in a de-energized state. The current text states that the requirements are only applicable if the equipment is examined, adjusted, serviced, or maintained while energized. The working space should be required no matter if the equipment is energized or not. This proposed revision will bring clarity to Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 15:42:20 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not improve clarity.

Public Input No. 685-NFPA 70-2023 [Section No. 110.26(B)]

~~(B) Clear Spaces.~~

~~Working space required by this section shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be suitably guarded.~~

Statement of Problem and Substantiation for Public Input

The first sentence is not needed due to the new (2023) language of 110.26(A)(6). The remainder is safe work practices, not installation requirements. This belongs in NFPA 70E, not NFPA 70.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 20 14:39:39 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The existing language in 110.26(A)(6) does not make a clear statement as to the storage issue. Leaving the language in 110.26(B) will keep the area clear of storage/debris, as well as providing proper guarding. Section 110.26(B) is referenced by fire marshals conducting routine inspections after an installation has been made. This PI does not contain technical substantiation as required by the Regulations Governing the Development of NFPA Standards 4.3.4.1(d). and 4.3.4.2. The requirements in 110.26(A)(6) and 110.26(B) are not redundant.

Public Input No. 1751-NFPA 70-2023 [Section No. 110.26(C)(2)]

(2) Large Equipment.

For large equipment that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to and egress from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high at each end of the working space. This requirement shall apply to either of the following conditions:

(1) For equipment rated 1200 amperes or where the combined ampere rating of multiple pieces of equipment is 1200 amperes or more and where the combined width is over 1.8 m (6 ft) ~~wide~~

(2) For service disconnecting means installed in accordance with 230.71(B) where the combined ampere rating is 1200 amperes or more and where the combined width is over 1.8 m (6 ft)

A single entrance to and egress from the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (C)(2)(b) is met.

(a) *Unobstructed Egress.* Where the location permits a continuous and unobstructed way of egress travel, a single entrance to the working space shall be permitted.

(b) *Extra Working Space.* Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located such that the distance from the equipment to the nearest edge of the entrance is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

Additional Proposed Changes

File Name	Description	Approved
110.26_C_2_.pdf	Newer electric room with trap points.	
IMG_0043.jpg	Picture 1 of actual install creating a trap point.	
IMG_0044.jpg	Picture 2 of install creating trap point.	

Statement of Problem and Substantiation for Public Input

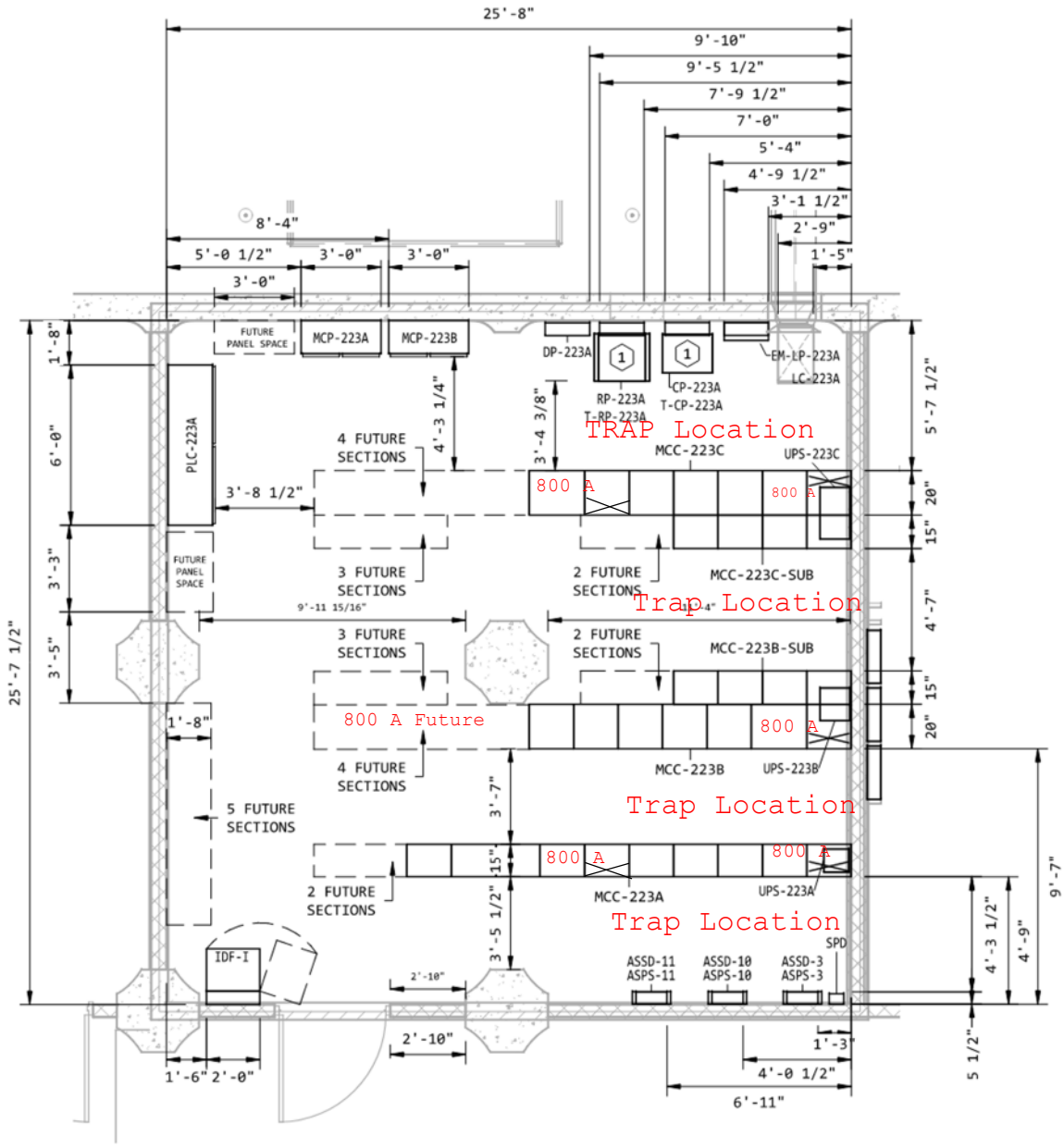
Large Equipment with amperages of less than 1200 amperes are being installed in multiple sections and powered with separate overcurrent protection devices, but when combined are more than 6 feet in width have the potential of trapping workers in aisleway's between electric gear such as MCC's and switchgear that are facing each other and butted up against the wall on one end, or when it creates a U-shaped leaves only one path out of the working space. We are seeing workers question installations and also have had customers require the two paths out of the working space. This will match service requirement as found in 110.26 (C) (2)(1), See attached pictures and drawings to show safety concern.

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: Lowell Reith IEC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 31 17:31:57 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed change as written by the submitter would introduce confusion as it attempts to combine the single and multiple equipment lineups into the same requirement


25'-8"
9'-10"
9'-5 1/2"
7'-9 1/2"
7'-0"
5'-4"
4'-9 1/2"
3'-1 1/2"
2'-9"
1'-5"
8'-4"
5'-0 1/2"
3'-0"
3'-0"
3'-0"
FUTURE PANEL SPACE
MCP-223A
MCP-223B
DP-223A
RP-223A
T-RP-223A
CP-223A
T-CP-223A
EM-LP-223A
LC-223A
TRAP Location
MCC-223C
UPS-223C
800 A
800 A
PLC-223A
4 FUTURE SECTIONS
4'-3 1/4"
3'-4 3/8"
3'-8 1/2"
3 FUTURE SECTIONS
2 FUTURE SECTIONS
MCC-223C-SUB
Trap Location
9'-11 15/16"
3 FUTURE SECTIONS
2 FUTURE SECTIONS
MCC-223B-SUB
800 A Future
800 A
MCC-223B
UPS-223B
4 FUTURE SECTIONS
Trap Location
5 FUTURE SECTIONS
800 A
800 A
2 FUTURE SECTIONS
MCC-223A
UPS-223A
Trap Location
IDF-I
ASSD-11
ASPS-11
ASSD-10
ASPS-10
ASSD-3
ASPS-3
SPD
2'-10"
2'-10"
1'-6"
2'-0"
1'-3"
4'-0 1/2"
6'-11"
25'-7 1/2"
1'-8"
6'-0"
3'-3"
3'-5"
1'-8"
5'-7 1/2"
20"
15"
4'-7"
20"
15"
3'-7"
15"
3'-5 1/2"
9'-7"
4'-3 1/2"
4'-9"
5 1/2"

Public Input No. 1943-NFPA 70-2023 [Section No. 110.26(C)(2)]

(2) Large Equipment.

For large equipment that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to and egress from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high at each end of the working space. This requirement shall apply to either of the following conditions:

(1) For equipment rated ~~1200 amperes~~ 1000 amperes or where the combined ampere rating of multiple pieces of equipment is 1000 amperes or more and where the width or combined width is over 1.8 m (6 ft) ~~wide~~

(2) For service disconnecting means installed in accordance with 230.71(B) where the combined ampere rating is ~~1200~~ 1000 amperes or more and where the combined width is over 1.8 m (6 ft)

A single entrance to and egress from the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (C)(2)(b) is met.

(a) *Unobstructed Egress.* Where the location permits a continuous and unobstructed way of egress travel, a single entrance to the working space shall be permitted.

(b) *Extra Working Space.* Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located such that the distance from the equipment to the nearest edge of the entrance is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

Statement of Problem and Substantiation for Public Input

Large equipment with amperages of less than 1000 amperes are being installed in multiple sections and powered with separate overcurrent protection devices, but when combined are more than 6 feet in width have a potential of trapping workers in aisleways between electric gear such as MCC's and switchgear that are facing each other and butted up against a wall on one end, or when it creates a U or L shape and leaves only one path out of the working space. We are seeing workers questions on installations and also have had customers that require the two paths out of the working space.
The lowering of the 1200 ampere to 1000 ampere matches what was done in 110.16(B). The lowering of ampere rating helps protect the worker from arc flash.

Submitter Information Verification

Submitter Full Name: Lowell Reith
Organization: Interstates Construction Service
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 08 11:31:42 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed change as written by the submitter would introduce confusion as it attempts to combine the single and multiple equipment lineups into the same requirement

Public Input No. 2090-NFPA 70-2023 [Section No. 110.26(C)(2)]

(2) Large Equipment.

For large equipment that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to and egress from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high at each end of the working space. This requirement shall apply to either of the following conditions:

(1) For equipment rated 1200 amperes or more and over 1.8 m (6 ft) wide

(2) For service disconnecting means installed in accordance with 230.71(B) where the combined ampere rating is 1200 amperes or more and where the combined width is over 1.8 m (6 ft)

(3) For modular meter centers this requirement only applies at the main section where it contains an overcurrent device 1200 amperes or more.

A single entrance to and egress from the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (C)(2)(b) is met.

(a) *Unobstructed Egress.* Where the location permits a continuous and unobstructed way of egress travel, a single entrance to the working space shall be permitted.

(b) *Extra Working Space.* Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located such that the distance from the equipment to the nearest edge of the entrance is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

Statement of Problem and Substantiation for Public Input

Modular meter centers come in many varieties and are widely used for multifamily projects as well as light commercial where space is limited for service equipment such as on a mixed use building, or on a retail strip mall. Modular meter centers can contain a main breaker or main fuse in the main section, and can also feed-through to modular meter centers throughout a building or high-rise through conduit & conductors or through busway. Modular meter center mains can vary from 600A to 2400A or can be mounted on busway from 600A to 5000A; please note that west coast utilities (EUSERC) do not allow meter centers larger than 1200A. It is common for the upper floor meter centers which are feed-through to contain no OCPDs as they are MLO equipment, and contain a varying amount of meter stacks. The meter stacks can be 240V 1Φ or 208V 3Φ and come in up to 6 high 125A 1Φ, 4 high 225A 3Φ, or 2 high 400A 3Φ. Please note that some utilities do not allow 400A meters. Meter centers can also contain horizontal bus sections as extensions or elbows. Meter centers can also contain SPD stacks.The code is ambiguous if these upper floor meter centers should be considered "large equipment". The proposed language would clarify that the large equipment requirement only applies if the meter center contains an overcurrent device 1200A or more.
Another issue is with future retail installations; additional meter stacks can be added in the future after the initial main section has been installed. This makes enforcement of the large equipment requirement after initial installation in an electric room problematic at best. The proposed language would resolve this issue by clarifying that the "large equipment" requirement only applies at main device, and not to the meter stacks. This alleviates problems with adding additional meter stacks to a meter center for tenant fitouts at a later date. It also resolves an issue about whether the meter stacks should be considered service equipment or not for the purposes of determining the combined width of equipment by stating clearly that the large equipment requirement would only apply at the main section.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2038-NFPA 70-2023 [Section No. 110.26(A)(1)]	Related to working space requirements of Meter Centers.

Submitter Information Verification

Submitter Full Name: Josh Wiley
Organization: Jordan Skala Engineers
Street Address:
City:
State:
Zip:

Submittal Date: Fri Aug 11 17:52:22 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The service disconnect for modular meter centers is already required per 110.26(C)(2).

Public Input No. 1906-NFPA 70-2023 [Section No. 110.26(D)]

(D) Illumination.

Illumination shall be provided for all working spaces about service equipment, switchboards, switchgear, enclosed panelboards, or motor control centers installed indoors. Control by automatic means shall not be permitted to control all illumination within the working space. Illumination shall be provided for all working spaces about switchboards, switchgear, enclosed panelboards, or motor control centers installed outdoors. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles.

Statement of Problem and Substantiation for Public Input

Switchboards, switchgear, enclosed panelboards, or motor control centers installed outdoors require periodic reset of overcurrent devices or overload devices. Adequate lighting to reset or adjust these items should be provided for personnel safety.

Submitter Information Verification

Submitter Full Name: Mike McGivern
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 07 14:33:24 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The expansion for the lighting requirement to be outdoors in all occupancies without considering the automatic controls for the outdoor lighting to be an allowance is overly restrictive.

Public Input No. 3540-NFPA 70-2023 [Section No. 110.26(D)]

(D) Illumination.

Illumination shall be provided for all working spaces about service equipment, switchboards, switchgear, enclosed panelboards, or motor control centers installed ~~indoors~~ . Control by automatic means shall not be permitted to control all illumination within the working space. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Outdoor remote locations may be controlled by an approved switch-controlled means. Exception No. 1, for switched receptacles.

Statement of Problem and Substantiation for Public Input

Outdoor service equipment, switchboards, switchgear, panelboards, or motor control centers may be accessed for maintenance or service at night. A flashlight may be the only means of illumination. For remote locations a simple switch-controlled luminaire would meet this requirement.
There are several PI's with alternate wording for the panel to consider.

Submitter Information Verification

Submitter Full Name: Richard Hollander
Organization: Shums Coda Associates
Street Address:
City:
State:
Zip:
Submittal Date: Mon Sep 04 18:10:56 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The expansion for the lighting requirement to be outdoors in all occupancies without considering the automatic controls for the outdoor lighting to be an allowance is overly restrictive.

Public Input No. 3541-NFPA 70-2023 [Section No. 110.26(D)]

(D) Illumination.

Illumination shall be provided for all working spaces about service equipment, switchboards, switchgear, enclosed panelboards, or motor control centers ~~installed indoors~~ . Control by automatic means shall not be permitted to control all illumination within the working space. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles.

Statement of Problem and Substantiation for Public Input

Outdoor service equipment, switchboards, switchgear, panelboards, or motor control centers may be accessed for maintenance or service at night. A flashlight may be the only means of illumination. For remote locations a simple switch-controlled luminaire would meet this requirement.
There are several PI's with alternate wording for the panel to consider.

Submitter Information Verification

Submitter Full Name: Richard Hollander
Organization: Shums Coda Associates
Street Address:
City:
State:
Zip:
Submittal Date: Mon Sep 04 18:14:56 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The expansion for the lighting requirement to be outdoors in all occupancies without considering the automatic controls for the outdoor lighting to be an allowance is overly restrictive.

Public Input No. 3633-NFPA 70-2023 [Section No. 110.26(D)]

(D) Illumination.

~~Illumination~~ A minimum 1 ft candle illumination shall be provided for all working spaces about service equipment, switchboards, switchgear, enclosed panelboards, or motor control centers installed indoors. Control by automatic means shall not be permitted to control all illumination within the working space. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles.

Exception: Automatic lighting control devices with a manual means to bypass the automatic control shall be permitted to provide illumination within the working space.

Statement of Problem and Substantiation for Public Input

Adding 1ft candle illumination to match the building code requirements. A minimum level of illumination will enhance electrical safety in electrical rooms at the working space area of panelboards and switchboards. There are many times these spaces just have one light that doesn't provide enough illumination to work on the equipment safely.

It's not 100% clear that the language in 110.26(D) allows automatic control devices with a manual override to be used for lighting in the working space. The proposed Exception will add clarity that automatic control devices with a "ON" and "OFF" function and no automatic time-out feature is allowed to be used. The proposed exception will also enhance usability because Energy Codes are requiring automatic control for the lighting in areas where panelboards and switchboards are located.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 10:48:27 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Requiring a minimum of 1 footcandle would be overly restrictive and does not consider the task to be performed and the location or the environment. The automatic means could be unsafe and could allow a worker to forget to bypass the automatic means thus leaving the worker in the dark.

Public Input No. 3641-NFPA 70-2023 [Section No. 110.26(D)]

(D) Illumination.

(1) Indoor Working Space. Illumination shall be provided for all working spaces about service equipment, switchboards, switchgear, enclosed panelboards, or motor control centers installed indoors.

(2) Automatic Means Not Permitted. Control by automatic means shall not be permitted to control all illumination within the working space. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles.

Statement of Problem and Substantiation for Public Input

Breaking up 110.26(D) into a list item format to facilitate understanding for Code users. In accordance with NFPA Style Manual section 3.5.1.2 additional subdivisions shall be used where multiple requirements can be broken into independent requirements.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 11:25:33 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Revising the requirement into a list format would not increase usability and clarity.

Public Input No. 3933-NFPA 70-2023 [Section No. 110.26(D)]

(D) Illumination.

~~Illumination~~ Illuminiation shall be provided for all working spaces about service equipment, switchboards, switchgear, enclosed panelboards, or motor control centers installed indoors. Control of all luminaire(s) by automatic means shall not be permitted ~~to control all illumination~~ within the working space. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles.

Statement of Problem and Substantiation for Public Input

Illumination is defined as light. A luminaire is a complete lighting unit that consists of a light source that provides illumination, but a luminaire is not illumination.
Automatic is defined in the NEC as “performing a function without the necessity of human intervention”.
Nonautomatic is defined in the NEC as “requiring human intervention to perform a function”.
This allows luminaires to be automatically controlled to dim the illumination. A human must interact with a control input in order to control the remaining illumination. The control system would not automatically control all of the illumination.
In this case, the illumination is not controlled by automatic means only. The automatically dimed portion of the illumination is automatically controlled, the remaining illumination is controlled by nonautomatic means.
In large areas (ie industrial highbays, assembly areas, labs, and open offices) and corridors where only a portion of the area is working space for the specified electrical equipment, Illumination in that space is provided by multiple luminaires. By judging conformance by illumination instead of a luminaire, the text allows for a luminaire to automatically be controlled so long as all of the illumination the luminaire provides is not completely automatically controlled. For example, a luminaire that automatically dims, but never automatically turns off. This is common function built into luminaires with integral sensors as well as lighting control systems. By explicitly requiring a luminaire(s) that are manually controlled in the space, the intent of the code is clearly communicated requiring a manually controlled luminaire.

Submitter Information Verification

Submitter Full Name: Jason Andrews
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 10:48:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9225-NFPA 70-2024
Statement: The revised wording improves clarity that the control is for the luminaire(s), not to control illumination of the working space.

Public Input No. 380-NFPA 70-2023 [New Section after 110.26(E)(1)]

TITLE OF NEW CONTENT HERE: 110.26 (E) (1) (e)

(e) Accessibility to Dedicated Electrical Space. Access to the dedicated electrical space required by 110.26 (E) (1) (a) shall be maintained with a minimum clear space of 559mm (22inches) out horizontally from the dedicated electrical space and a width of 762mm (30inches) or the width of the equipment which ever is greater. No piping, ducts, leak protection apparatus, or other equipment foreign to the electrical installation shall be located in this zone.

Statement of Problem and Substantiation for Public Input

The dedicated electrical space required by 110.26 (E) (1) (a) is an important requirement to ensure existing and future raceways and wiring can be installed from the equipment without the interference of other foreign systems being in the way. The problem that exists and is becoming more present as electrical rooms are getting smaller and smaller is that piping and ductwork are being installed right up to the footprint of the equipment. Staying outside the dedicated electrical space, and not encroaching into the working space, but not allowing access to the dedicated electrical space. the addition of this new requirement in the code will give the contractor and inspection agency the teeth they really need to ensure no foreign systems are installed in such proximity to the dedicated electrical space that prohibits access to that space. Situations such as this are being seen currently in our jurisdiction and without code language addressing the area outside of the dedicated electrical space, it is very difficult if not impossible to get other contractors to remove or relocate their systems. I respectfully request consideration to this much needed additional requirement to ensure proper access to work within the dedicated electrical space is provided.

Submitter Information Verification

Submitter Full Name: Robert Wemmer
Organization: Pikes Peak Regional Building Department
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 01 16:13:18 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed language is in conflict with 110.26(E)(1)(b).

Public Input No. 246-NFPA 70-2023 [Section No. 110.26(E)(1)]

(1) Indoor.

Indoor installations shall comply with 110.26(E)(1)(a) through (E)(1)(d).

(a) *Dedicated Electrical Space.* The space equal to the width and depth of the equipment and extending from the floor to a height of 1.8 m (6 ft) above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No piping, ducts, leak protection apparatus, or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Suspended ceilings with removable panels shall be permitted within the 1.8 m (6 ft) zone.

(b) *Foreign Systems.* The area above the dedicated space required by 110.26(E)(1)(a) shall be permitted to contain foreign systems, provided protection is installed to avoid damage to the electrical equipment from condensation, leaks, or breaks in such foreign systems.

(c) *Sprinkler Protection.* Sprinkler protection shall be permitted for the dedicated space where the piping complies with this section.

(d) ~~*Suspended Ceilings*~~ *Structural Ceilings* . A ~~dropped~~ ceiling with removable panels such as a dropped , suspended, or a similar ceiling that does not add strength to the building structure shall not be considered a structural ceiling.

Additional Proposed Changes

File Name	Description	Approved
110.26_E_1_d_.pdf	Suspended ceiling types	

Statement of Problem and Substantiation for Public Input

Installing a panelboard or switchboard on the wall below a suspended solid sheetrock ceiling without the 6ft clearance is presently considered a violation by many installers and AHJs. But this type of installation poses no hazards or real-world problems and should be permitted. This revision seeks to allow this type of installation. Many types of dropped or suspended ceilings exist that may not be considered " structural" as described in this present text, but these ceilings do in fact create a solid "finished" ceiling, For example; dropped or suspended ceilings without removable tiles can be made from drywall attached to metal framing members suspended from the metal trusses above. Wire mesh and plaster can also be used to create a solid finished ceiling on metal framing that is suspended from the concrete deck above. These types of solid ceilings create the finished space but are presently not permitted within the 6ft. dedicated space above electrical switchboards or panelboards. But why not? Installing a panelboard or switchboard in a space where this type of ceiling is installed at a typical height of 8-10ft. is virtually impossible to comply with the 6ft, dedicated space required above the electrical equipment! Unless of course a portion of the ceiling is removed above the electrical equipment! This seems too extreme. There is simply no good reason to prohibit these types of solid ceilings in the 6ft. space above electrical equipment. There seems to be confusion about which types of dropped or suspended ceilings are meant to be covered by this rule. I believe this revision will help clarify that issue. Please see PDF example submitted with this PI. Revising the name of the section heading from "Suspended Ceilings" to "Structural Ceilings" brings better attention to this requirement since many Code users simply stop reading once they see "Suspended Ceilings" thinking that this rule only applies to "suspended ceilings" but not "dropped ceilings" or "similar ceilings". I think the vast majority of Code users think only of suspended ceilings with removable tiles when they see a heading titled "Suspended Ceilings". This revision will help refocus attention on the fact that there are MANY other types of suspended or dropped ceilings.

Submitter Information Verification

Submitter Full Name: Russ Leblanc
Organization: Leblanc Consulting Services
Street Address:
City:
State:
Zip:
Submittal Date: Sun Jan 29 07:55:10 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not improve clarity or usability. The proposed revision would add confusion as ceilings with removable panels are not structural elements. The proposed revision to the title of (1)(d) conflicts with the requirements of (1)(d).

"110.26(E)(1)(d)- A dropped, suspended, or similar ceiling that does not add strength to the building structure shall not be considered a structural ceiling."

Installing a switchboard on the wall below a suspended sheetrock ceiling without the 6ft. Clearance is presently a violation of 110.26(E)(1)(d) but presents no hazards and no real-world problems and should be allowed.

Installing a surface-mounted panelboard on the wall below a suspended sheetrock ceiling without the 6ft clearance is presently a violation of 110.26(E)(1)(d), but poses no real-world hazards or problems and should be allowed!

Public Input No. 738-NFPA 70-2023 [Section No. 110.26(E)(1)]

(1) Indoor.

Indoor installations shall comply with 110.26(E)(1)(a) through (E)(1)(d).

(a) *Dedicated Electrical Space.* The space equal to the width and depth of the equipment and extending from the floor to a height of 1.8 m (6 ft) above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No piping, ducts, leak protection apparatus, or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Suspended ceilings with removable panels ~~shall~~ and sprinkler heads and the pipe that feeds exclusively it shall be permitted within the 1.8 m (6 ft) zone.

(b) *Foreign Systems.* The area above the dedicated space required by 110.26(E)(1)(a) shall be permitted to contain foreign systems, provided protection is installed to avoid damage to the electrical equipment from condensation, leaks, or breaks in such foreign systems.

(c) *Sprinkler Protection.* Sprinkler protection shall be permitted for the dedicated space where the piping complies with this section. Pipes that feed devices other than the sprinkler heads protecting exclusively the dedicated space will not be allowed in the dedicated space.

(d) *Suspended Ceilings.* A dropped, suspended, or similar ceiling that does not add strength to the building structure shall not be considered a structural ceiling.

Statement of Problem and Substantiation for Public Input

Clarified the situation regarding sprinkler protection and the overall section that it's under (dedicated equipment space -- 110.26).

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 26 02:16:52 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not improve clarity. Inadequate technical substantiation is provided per Regulations Governing the Development of NFPA Standards 4.3.4.1(d). and 4.3.4.2.

Public Input No. 794-NFPA 70-2023 [Section No. 110.26(E)(1)]

(1) Indoor.

Indoor installations shall comply with 110.26(E)(1)(a) through (E)(1)(d).

(a) *Dedicated Electrical Space.* The space equal to the width and depth of the equipment and extending from the floor to a height of 1.8 m (6 ft) above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No piping, ducts, leak protection apparatus, or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Suspended ceilings with removable panels shall be permitted within the ~~1.8 m (6 ft) zone.~~ dedicated electrical space .

(b) *Foreign Systems.* The ~~area~~ space above the dedicated space required by 110.26(E)(1)(a) ~~shall~~ , extending to the structural ceiling, shall be permitted to contain foreign systems, provided protection is installed to avoid damage to the electrical equipment from condensation, leaks, or breaks in such foreign systems.

(c) *Sprinkler Protection.* Sprinkler protection shall be permitted for the dedicated space where the piping complies with this section.

(d) *Suspended Ceilings.* A dropped, suspended, or similar ceiling that does not add strength to the building structure shall not be considered a structural ceiling.

Statement of Problem and Substantiation for Public Input

1) Current language of 110.26(E)(1)(b) does not establish any upper boundary for "the area above" the dedicated space. Thus, the current language could be legally interpreted to require drip protection for foreign systems at any height above the electrical equipment, including above the roof above or one or more floors above the electrical equipment in a multi-story building. The proposal captures all space above the dedicated equipment space, up to the structural ceiling (regardless of the height thereof).

2) Change language from "area" to "space" to coordinate terminology with 110.26(E)(1). The word "area" implies a 2-dimensional region, not a 3-dimensional volume which is the intent.

3) Coordinate terminology by replacing the ambiguous/undefined term "zone" in the 110.26(E)(1)(a) Exception with language used and defined in the section.

Submitter Information Verification

Submitter Full Name: Edward Henderson
Organization: Engineering Services Group, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 10 12:07:50 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not improve clarity or usability. Inadequate technical substantiation is provided per Regulations Governing the Development of NFPA Standards 4.3.4.1(d) and 4.3.4.2.

Public Input No. 3481-NFPA 70-2023 [Section No. 110.26(E)(2)]

(2) Outdoor.

Outdoor installations shall comply with 110.26(E)(2)(a) through (E)(2)(c).

(a) *Installation Requirements.* Outdoor electrical equipment shall be the following:

(2) Installed in identified enclosures

(3) Protected from accidental contact by unauthorized personnel or by vehicular traffic

(4) Protected from accidental spillage or leakage from piping

~~systems~~

(1)

(e) *Work Space.* The working clearance space shall include the zone described in 110.26(A). No architectural appurtenance or other equipment shall be located in this zone.

(f) *Dedicated Equipment Space.* The space equal to the width and depth of the equipment, and extending from grade to a height of 1.8 m (6 ft) above the equipment, shall be dedicated to the electrical installation. No piping or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Structural overhangs or roof extensions shall be permitted in this zone.

Statement of Problem and Substantiation for Public Input

The danger is that of leaks from piping. "Piping systems" adds nothing, and is an undefined term. If HVAC equipment has a condensate drain pipe (tubing) that drips on electrical equipment, it may not be considered a piping system, but the danger is similar.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3482-NFPA 70-2023 [Section No. 250.32(D)]	
Public Input No. 3483-NFPA 70-2023 [Section No. 250.52(A)(8)]	
Public Input No. 3485-NFPA 70-2023 [Section No. 250.104]	

Submitter Information Verification

Submitter Full Name: David Shapiro
Organization: Safety First Electrical
Street Address:
City:
State:
Zip:
Submittal Date: Sun Sep 03 23:01:33 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not increase clarity.

Public Input No. 3543-NFPA 70-2023 [Section No. 110.26(E)(2)]

(2) Outdoor.

Outdoor installations shall comply with 110.26(E)(2)(a) through (E)(2)(c).

(a) *Installation Requirements.* Outdoor electrical equipment shall be the following:

(2) Installed in identified enclosures

(3) Protected from accidental contact by unauthorized personnel or by vehicular traffic

(4) Protected from accidental spillage or leakage from piping systems

(5) Illumination shall be provided for all working spaces about service equipment, switchboards, switchgear, panelboards, or motor control centers installed. Outdoor remote locations may be controlled by an approved switch-controlled means.

(f) *Work Space.* The working clearance space shall include the zone described in 110.26(A). No architectural appurtenance or other equipment shall be located in this zone.

(g) *Dedicated Equipment Space.* The space equal to the width and depth of the equipment, and extending from grade to a height of 1.8 m (6 ft) above the equipment, shall be dedicated to the electrical installation. No piping or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Structural overhangs or roof extensions shall be permitted in this zone.

Statement of Problem and Substantiation for Public Input

Outdoor service equipment, switchboards, switchgear, panelboards, or motor control centers may be accessed for maintenance or service at night. A flashlight may be the only means of illumination. For remote locations a simple switch-controlled luminaire would meet this requirement.
There are several PI's with alternate wording for the panel to consider.

Submitter Information Verification

Submitter Full Name: Richard Hollander
Organization: Shums Coda Associates
Street Address:
City:
State:
Zip:
Submittal Date: Mon Sep 04 18:21:58 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Section 110.26(E) is about dedicated space. Addressing the outdoor illumination would be better located in 110.26(D).

Public Input No. 644-NFPA 70-2023 [Section No. 110.26(E)(2)]

(2) Outdoor.

Outdoor installations shall comply with 110.26(E)(2)(a) through (E)(2)(c).

(a) *Installation Requirements.* Outdoor electrical equipment shall be the following:

(2) Installed in identified enclosures

(3) Protected from accidental contact by unauthorized personnel or by vehicular traffic

(4) Protected from accidental spillage or leakage from piping systems

(e) ~~*Work Space.* The working clearance space shall include the zone described in 110.26(A) . No architectural appurtenance or other equipment shall be located in this zone.~~

(f) *Dedicated Equipment Space.* The space equal to the width and depth of the equipment, and extending from grade to a height of 1.8 m (6 ft) above the equipment, shall be dedicated to the electrical installation. No piping or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Structural overhangs or roof extensions shall be permitted in this zone.

Statement of Problem and Substantiation for Public Input

Although difficult to see in Terraview, this PI seeks only to remove item (b). The working space in 110.26(A) is already covered in 110.26(A). There is no reason to repeat it here. Working space and dedicated space are two sperate and distinct items. Referencing (A) in (E) only adds confusion.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
City:
State:
Zip:
Submittal Date: Mon Apr 17 12:22:29 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: 110.26(E)(2) is specifically for outdoor equipment. The removal of this language could be seen as deleting the requirements for working clearance for outdoor equipment.

Public Input No. 233-NFPA 70-2023 [Section No. 110.26(E) [Excluding any Sub-Sections]]

All service equipment, switchboards, switchgear,- ~~panelboards~~ enclosed panelboards , and motor control centers shall be located in dedicated spaces and protected from damage.

Exception: Control equipment that by its very nature or because of other rules of the Code must be adjacent to or within sight of its operating machinery shall be permitted in those locations.

Statement of Problem and Substantiation for Public Input

"Enclosed panelboards" is the correct term to be used here. "Panelboards" themselves are designed to be installed in enclosures. As defined in Article 100- "Panelboard, Enclosed. (Enclosed Panelboard) An assembly of buses and connections, overcurrent devices, and control apparatus with or without switches or other equipment, installed in a cabinet, cutout box, or enclosure suitable for a panelboard application." The dedicated space is required for the space above and below the ENCLOSURE for the panelboard rather than the panelboard itself.

Submitter Information Verification

Submitter Full Name: Russ Leblanc
Organization: Leblanc Consulting Services
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jan 28 10:05:25 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9231-NFPA 70-2024
Statement: Enclosed panelboards" is the correct term to use as a panelboard would be required to be installed in a cabinet, cutout box, or enclosure suitable for a panelboard application.

Public Input No. 527-NFPA 70-2023 [Section No. 110.26(E) [Excluding any Sub-Sections]]

All service equipment, switchboards, switchgear, enclosed panelboards, and motor control centers shall be located in dedicated spaces and protected from damage.

Exception: Control equipment that by its very nature or because of other rules of the Code must be adjacent to or within sight of its operating machinery shall be permitted in those locations.

Statement of Problem and Substantiation for Public Input

The addition of the word 'enclosed' makes the text technically correct to correspond with the new term 'Enclosed Panelboard' that was added to the 2023 NEC. The proposed definition will enhance usability throughout the NEC.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 04 13:50:20 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9231-NFPA 70-2024
Statement: Enclosed panelboards" is the correct term to use as a panelboard would be required to be installed in a cabinet, cutout box, or enclosure suitable for a panelboard application.

Public Input No. 2313-NFPA 70-2023 [Section No. 110.26 [Excluding any Sub-Sections]]

Working space, and access to and egress from working space, shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment. Open equipment doors shall not impede access to and egress from the working space. Access or egress is impeded if one or more simultaneously opened equipment doors restrict working space access to be less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high.

Exception: This requirement shall only apply to one row at a time where electrical equipment is installed in front of each other.

Statement of Problem and Substantiation for Public Input

This requirement adds tremendous cost to commercial projects where you have an electrical room with 2 rows of electrical equipment in front of each other and you open both equipment doors, more than likely this will definitely impede egress to less than 24 in. wide. To comply with the requirement, you would have to add the 24 in. to the 110.26(A)(1) conditions and have both equipment significantly spaced out. By reducing it to just one row where equipment is in front of each other is a more practical solution while still keeping the safety concern of the electrical worker.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 15 20:55:39 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: This recommendation drastically reduces safety for the electrical worker and others who may be present and unable to egress as presently required. Using “tremendous cost” as substantiation for decreasing safety has not been adequately substantiated.

Public Input No. 4234-NFPA 70-2023 [Section No. 110.26 [Excluding any Sub-Sections]]

Working space, and access to and egress from working space, shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment. Open equipment doors ~~shall~~ , and personnel doors intended for entrance to and egress from the required working space shall not impede access to and egress from the working space. Access or egress is impeded if one or more simultaneously opened equipment doors, or personnel doors restrict working space access to be less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high.

Statement of Problem and Substantiation for Public Input

In the 2023 NEC, a public input was accepted to relocate a portion of the 2020 code language in 110.26(C)(2) (pertaining to open equipment doors) to the parent text in 110.26. This requirement previously applied only to “large equipment” in 110.26(C)(2). With this relocation, the language on open equipment doors now applies to more than just "large equipment" which brings additional safety.
The 2023 NEC brought a code change in 110.26(C)(3) requiring personnel doors to be able to open at least 90° which is great but 110.26(C)(3) only applies when there is a door closer than 25 feet to the required working space of equipment rated 800 amperes or more that contains overcurrent devices, switching devices, or control devices. Article 110 is silent on the swing of personnel doors installed that provide similar access/egress to similar electrical equipment rated less than 800 amps.
The following language was added to 110.26 during the 2023 code development process: "Open equipment doors shall not impede access to and egress from the working space. Access or egress is impeded if one or more simultaneously opened equipment doors restrict working space access to be less than 610 mm (24 in.) wide and 2.0 m (6 ½ ft) high".
The above language added to 110.26 in 2023 is intended for all electrical equipment to permit ready and safe operation and maintenance of such equipment, as well as proper egress. If access or egress is considered impeded when one or more simultaneously opened equipment doors restrict working space access to be less than 24 inches wide and 6.5 feet high, then shouldn't the same principle also apply to the actual personnel doors (if installed) that are intended for entry to and egress from the workspace for equipment installed closer than 25 feet from the personnel doors regardless of the ampere rating of the equipment?

Submitter Information Verification

Submitter Full Name: Jeffrey Simpson
Organization: ElectricalLicenseRenewal.com
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 02:50:00 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Personnel doors do not prevent entrance to or egress from the working space

Public Input No. 1631-NFPA 70-2023 [Section No. 110.28]

110.28 Enclosure Types.

Enclosures (other than surrounding fences or walls covered in 110.31) of switchboards, switchgear, enclosed panelboards, industrial control panels, motor control centers, meter sockets, enclosed switches, transfer switches, power outlets, circuit breakers, adjustable-speed drive systems, pullout switches, portable power distribution equipment, termination boxes, general-purpose transformers, fire pump controllers, fire pump motors, and motor controllers, rated not over 1000 volts nominal and intended for such locations, shall be marked with an enclosure-type number as shown in Table 110.28.

Table 110.28 shall be used for selecting these enclosures for use in specific locations other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, corrosion, or contamination that may occur within the enclosure or enter via the raceway or unsealed openings.

Table 110.28 Enclosure Selection

Provides a Degree of Protection Against the Following Environmental Conditions	For Outdoor Use									
	Enclosure Type Number									
	3	3R	3S	3X	3RX	3SX	4	4X	6	6P
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X	X	X	X
Rain, snow, and sleet	X	X	X	X	X	X	X	X	X	X
Sleet*	—	—	X	—	—	X	—	—	—	—
Windblown dust	X	—	X	X	—	X	X	X	X	X
Hosedown	—	—	—	—	—	—	X	X	X	X
Corrosive agents	—	—	—	X	X	X	—	X	—	X
Temporary submersion	—	—	—	—	—	—	—	—	X	X
Prolonged submersion	—	—	—	—	—	—	—	—	—	X

Provides a Degree of Protection Against the Following Environmental Conditions	For Indoor Use									
	Enclosure Type Number									
	1	2	4	4X	5	6	6P	12	12K	13
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X	X	X	X
Falling dirt	X	X	X	X	X	X	X	X	X	X
Falling liquids and light splashing	—	X	X	X	X	X	X	X	X	X
Circulating dust, lint, fibers, and flyings	—	—	X	X	—	X	X	X	X	X
Settling airborne dust, lint, fibers, and flyings	—	—	X	X	X	X	X	X	X	X
Hosedown and splashing water	—	—	X	X	—	X	X	—	—	—
Oil and coolant seepage	—	—	—	—	—	—	—	X	X	X
Oil or coolant spraying and splashing	—	—	—	—	—	—	—	—	—	X
Corrosive agents	—	—	—	X	—	—	X	—	—	—
Temporary submersion	—	—	—	—	—	X	X	—	—	—
Prolonged submersion	—	—	—	—	—	—	X	—	—	—

*The mechanism shall be operable when ice covered.

Informational Note No. 1: The term *raintight* is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 6, and 6P. The term *rainproof* is typically used in conjunction with Enclosure Types 3R and 3RX. The term *watertight* is typically used in conjunction with Enclosure Types 4, 4X, 6, and 6P. The term *driptight* is typically used in conjunction with Enclosure Types 2, 5, 12, 12K, and 13. The term *dusttight* is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 5, 6, 6P, 12, 12K, and 13.

Informational Note No. 2: See ANSI/IEC 60529, *Degrees of Protection Provided by Enclosures*, for ingress protection (IP) ratings.

Informational Note No. 3: See 502.10(A)(3), 502.10(B)(4), 503.10(A)(2), and 506.15(C)(9) for information on the use of dusttight enclosures in hazardous locations.

Informational Note No. 4: Some enclosure types, such as 12, 12K, or 13 enclosures, may be marked with an ancillary “-XH” for corrosive and hosedown capable indoor enclosure.

Informational Note No. 5: Some type 4X enclosures may be marked “indoor only.”

Informational Note No. 6: See ~~UL 508A, *Standard for Industrial Control Panels* , for information on determining applicable requirements for evaluating type 4, 4X, and 12 ventilated enclosures.Informational Note No. 7: See~~ NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, for the description of the “Enclosure Type Rating: Ancillary — PW for Pressure Wash.”

Statement of Problem and Substantiation for Public Input

In the 2023 edition of NFPA 70, informational note 6 of Table 110.28 was added to inform readers to use ANSI/UL 508A, the Standard for Industrial Control Panels, for requirements for ventilated Type 4, 4X, and 12 enclosures. At the beginning of the 2023 NEC revision cycle, requirements did not exist in UL 50E (the ANSI Standard for Enclosures for Electrical Equipment, Environmental Considerations) for ventilated enclosures with these type ratings. However, since then UL 50E has been updated to include requirements for ventilated enclosures for all environmental type ratings. Requirements for ventilated enclosures also exist in NEMA 250. Therefor the note is not needed because these two ANSI standards for investigating environmental ratings cover the subject.

Submitter Information Verification

Submitter Full Name: Seth Carlton
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 27 15:14:35 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9234-NFPA 70-2024
Statement: Informational note No. 6 referencing UL 508A for evaluating type 4, 4X and 12 ventilated enclosures is not needed as requirements have been added to UL 50E.

Public Input No. 3059-NFPA 70-2023 [Section No. 110.28]

110.28 Enclosure Types.

Enclosures (other than surrounding fences or walls covered in 110.31) of switchboards, switchgear, enclosed panelboards, industrial control panels, motor control centers, meter sockets, enclosed switches, transfer switches, power outlets, circuit breakers, adjustable-speed drive systems, pullout switches, portable power distribution equipment, termination boxes, general-purpose transformers, fire pump controllers, fire pump motors, and motor controllers, rated not over 1000 volts nominal and intended for such locations, shall be marked with an enclosure-type number as shown in Table 110.28.

Table 110.28 shall be used for selecting these enclosures for use in specific locations other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, corrosion, or contamination that may occur within the enclosure or enter via the raceway, cable, or unsealed openings.

Table 110.28 Enclosure Selection

Provides a Degree of Protection Against the Following Environmental Conditions	For Outdoor Use									
	Enclosure Type Number									
	3	3R	3S	3X	3RX	3SX	4	4X	6	6P
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X	X	X	X
Rain, snow, and sleet	X	X	X	X	X	X	X	X	X	X
Sleet*	—	—	X	—	—	X	—	—	—	—
Windblown dust	X	—	X	X	—	X	X	X	X	X
Hosedown	—	—	—	—	—	—	X	X	X	X
Corrosive agents	—	—	—	X	X	X	—	X	—	X
Temporary submersion	—	—	—	—	—	—	—	—	X	X
Prolonged submersion	—	—	—	—	—	—	—	—	—	X

Provides a Degree of Protection Against the Following Environmental Conditions	For Indoor Use									
	Enclosure Type Number									
	1	2	4	4X	5	6	6P	12	12K	13
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X	X	X	X
Falling dirt	X	X	X	X	X	X	X	X	X	X
Falling liquids and light splashing	—	X	X	X	X	X	X	X	X	X
Circulating dust, lint, fibers, and flyings	—	—	X	X	—	X	X	X	X	X
Settling airborne dust, lint, fibers, and flyings	—	—	X	X	X	X	X	X	X	X
Hosedown and splashing water	—	—	X	X	—	X	X	—	—	—
Oil and coolant seepage	—	—	—	—	—	—	—	X	X	X
Oil or coolant spraying and splashing	—	—	—	—	—	—	—	—	—	X
Corrosive agents	—	—	—	X	—	—	X	—	—	—
Temporary submersion	—	—	—	—	—	X	X	—	—	—
Prolonged submersion	—	—	—	—	—	—	X	—	—	—

*The mechanism shall be operable when ice covered.

Informational Note No. 1: The term *raintight* is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 6, and 6P. The term *rainproof* is typically used in conjunction with Enclosure Types 3R and 3RX. The term *watertight* is typically used in conjunction with Enclosure Types 4, 4X, 6, and 6P. The term *driptight* is typically used in conjunction with Enclosure Types 2, 5, 12, 12K, and 13. The term *dusttight* is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 5, 6, 6P, 12, 12K, and 13.

Informational Note No. 2: See ANSI/IEC 60529, *Degrees of Protection Provided by Enclosures*, for ingress protection (IP) ratings.

Informational Note No. 3: See 502.10(A)(3), 502.10(B)(4), 503.10(A)(2), and 506.15(C)(9) for information on the use of dusttight enclosures in hazardous locations.

Informational Note No. 4: Some enclosure types, such as 12, 12K, or 13 enclosures, may be marked with an ancillary “-XH” for corrosive and hosedown capable indoor enclosure.

Informational Note No. 5: Some type 4X enclosures may be marked “indoor only.”

Informational Note No. 6: See UL 508A, *Standard for Industrial Control Panels*, for information on determining applicable requirements for evaluating type 4, 4X, and 12 ventilated enclosures.

Informational Note No. 7: See NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, for the description of the “Enclosure Type Rating: Ancillary — PW for Pressure Wash.”

Statement of Problem and Substantiation for Public Input

Adding the word ‘cable’ to this requirement for clarification for Code users. This revision will ensure that the enclosures condensation, icing, corrosion, or contamination may enter in a cable as well as a raceway.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 09:52:09 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Adding the term “cable” does not improve clarity or usability.

Public Input No. 357-NFPA 70-2023 [Section No. 110.28]

110.28 Enclosure Types.

Enclosures (other than surrounding fences or walls covered in 110.31) of switchboards, switchgear, enclosed panelboards, industrial control panels, motor control centers, meter sockets, enclosed switches, transfer switches, power outlets, circuit breakers, adjustable-speed drive systems, pullout switches, portable power distribution equipment, termination boxes, general-purpose transformers, fire pump controllers, fire pump motors, and motor controllers, rated not over 1000 volts nominal and intended for such locations, shall be marked with an enclosure-type number as shown in Table 110.28.

Table 110.28 shall be used for selecting these enclosures for use in specific locations other than hazardous (classified) locations. The enclosures are not intended to protect against conditions such as condensation, icing, corrosion, or contamination that may occur within the enclosure or enter via the raceway or unsealed openings.

Table 110.28 Enclosure Selection

Provides a Degree of Protection Against the Following Environmental Conditions	For Outdoor Use											
	Enclosure Type Number											
	3	3R	3S	3X	3RX	3SX	4	4X	6	6P	7	9
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X	X	X	X	X	X
Rain, snow, and sleet	X	X	X	X	X	X	X	X	X	X	Note 9	
Sleet*	—	—	X	—	—	X	—	—	—	—	Note 9	
Windblown dust	X	—	X	X	—	X	X	X	X	X	Note 9	
Hosedown	—	—	—	—	—	—	X	X	X	X	Note 9	
Corrosive agents	—	—	—	X	X	X	—	X	—	X	Note 9	
Temporary submersion	—	—	—	—	—	—	—	—	X	X	Note 9	
Prolonged submersion	—	—	—	—	—	—	—	—	—	X	Note 9	

Provides a Degree of Protection Against the Following Environmental Conditions	For Indoor Use											
	Enclosure Type Number											
	1	2	4	4X	5	6	6P	7	9	12	12K	13
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X	X	X	X	X	X
Falling dirt	X	X	X	X	X	X	X	—	—	X	X	X
Falling liquids and light splashing	—	X	X	X	X	X	X	—	—	X	X	X
Circulating dust, lint, fibers, and flyings	—	—	X	X	—	X	X	X	X	X	X	X
Settling airborne dust, lint, fibers, and flyings	—	—	X	X	X	X	X	X	X	X	X	X
Hosedown and splashing water	—	—	X	X	—	X	X	—	—	—	—	—
Oil and coolant seepage	—	—	—	—	—	—	—	—	—	X	X	X
Oil or coolant spraying and splashing	—	—	—	—	—	—	—	—	—X	—	—	—
Corrosive agents	—	—	—	X	—	—	X	—	——	X	X	X
Temporary submersion	—	—	—	—	—	X	X	—	—	—	—	X
Prolonged submersion	—	—	—	—	—	—	X	—	—	—	—	—
Explosionproof	—	—	—	—	—	—	—	X	X	—	—	—
Dust-Ignition-Proof	—	—	—	—	—	—	—	—	X	—	—	—

*The mechanism shall be operable when ice covered.

Informational Note No. 1: The term *raintight* is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 6, and 6P. The term *rainproof* is typically used in conjunction with Enclosure Types 3R and 3RX. The term *watertight* is typically used in conjunction with Enclosure Types 4, 4X, 6, and 6P. The term *driptight* is typically used in conjunction with Enclosure Types 2, 5, 12, 12K, and 13. The term *dusttight* is typically used in conjunction with Enclosure Types 3, 3S, 3SX, 3X, 4, 4X, 5, 6, 6P, 12, 12K, and 13.

Informational Note No. 2: See ANSI/IEC 60529, *Degrees of Protection Provided by Enclosures*, for ingress protection (IP) ratings.

Informational Note No. 3: See 502.10(A)(3), 502.10(B)(4), 503.10(A)(2), and 506.15(C)(9) for information on the use of dusttight enclosures in hazardous locations.

Informational Note No. 4: Some enclosure types, such as 12, 12K, or 13 enclosures, may be marked with an ancillary "-XH" for corrosive and ~~hosedown~~ hose-down capable indoor enclosure.

Informational Note No. 5: Some type 4X enclosures may be marked "indoor only."

Informational Note No. 6: See UL 508A, *Standard for Industrial Control Panels*, for information on determining applicable requirements for evaluating type 4, 4X, and 12 ventilated enclosures.

Informational Note No. 7: See NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, for the description of the "Enclosure Type Rating: Ancillary — PW for Pressure Wash."

Informational Note No. 8: In hazardous (classified) locations, when properly installed and maintained, Type 7 enclosures are designed to contain an internal ignition without causing an external hazard. Type 9 enclosures are designed to prevent the ignition of combustible dust.

Informational Note No. 9: Where used outdoors, Enclosure Types 7 and 9 are intended to be used in conjunction with another Enclosure Type such as 3, 3S, 3SX, 3X, 4, 4X, 6, or 6P.

Informational Note No. 10: Enclosure Type 7 Explosion-proof enclosures demonstrate compliance with the requirements of ANSI/UL 1203 for use in hazardous (classified) locations classified as Class I, Division 1, Groups A, B, C, or D.

Informational Note No. 11: Enclosure Type 9 Dust-ignition-proof enclosures demonstrate compliance with the requirements of ANSI/UL 1203 for use in hazardous (classified) locations classified as Class II, Division 1, Groups E, F, or G.

Statement of Problem and Substantiation for Public Input

Now that the NEC style manual is moving like data to common areas it is only logical to include NEMA Types 7 and 9 enclosures in Art. 110.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 356-NFPA 70-2023 [Section No. 110.11]	Adds NEMA 7 & 9
Public Input No. 356-NFPA 70-2023 [Section No. 110.11]	

Submitter Information Verification

Submitter Full Name: Paul Guidry
Organization: Fluor Corp.
Affiliation: Associated Builders and Contractors
Street Address:
City:
State:
Zip:
Submittal Date: Sun Feb 19 14:36:02 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: It would not be appropriate to place Type 7 and Type 9 enclosures into Table 110.28 because the requirements specifically exclude hazardous classified locations from the table. The proposed revision does not improve clarity. No technical substantiation is provided per Regulations Governing the Development of NFPA Standards 4.3.4.1(d). and 4.3.4.2.

Public Input No. 1597-NFPA 70-2023 [Section No. 110.29]

110.~~29~~ 29 In Sight From (Within Sight From, Within Sight).

Where this *Code* specifies that one equipment shall be "in sight from," "within sight from," or "within sight of" another equipment, the specified equipment shall comply with 110.29(A) through (C):

(A) Accessibility. The access from one equipment to the other specified equipment shall be ~~visible and not more than 15 m (50 ft) distant from the other~~ unobstructed and accessible or readily accessible as specified by other parts of this *Code*.

Informational Note No. 1: See Article 100 for the definition of *Accessible*.

Informational Note No. 2: See Article 100 for the definition of *Accessible, Readily*.

(B) Visible. The specified equipment shall be visible from the other equipment.

(C) Distance. The specified equipment shall not be more than 15 m (50 ft.) from the other equipment .

Statement of Problem and Substantiation for Public Input

Disconnecting means for equipment is often located behind glass walls of control rooms and similar areas such as at slips in marinas and boatyards creating an opportunity for misinterpretation of accessibility of the disconnect itself but meeting the literal "within sight from" requirement. This revision will enhance the application of this requirement so the intent of the rule can be clear and not subjective when addressing gray areas regarding the safety afforded by the "in sight from" requirement. This revision should also improve electrical safety in the workplace compliance with the general principles of establishing electrically safe work conditions further protecting electrical worker/installers and service and maintenance personnel.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1634-NFPA 70-2023 [Section No. 430.102]	
Public Input No. 1635-NFPA 70-2023 [Section No. 440.14]	
Public Input No. 1634-NFPA 70-2023 [Section No. 430.102]	
Public Input No. 1635-NFPA 70-2023 [Section No. 440.14]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 27 09:21:41 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not improve clarity. Inadequate technical substantiation is provided per Regulations Governing the Development of NFPA Standards 4.3.4.1(d). and 4.3.4.2.

Public Input No. 2006-NFPA 70-2023 [Section No. 110.29]

110.29 In Sight From (Within Sight From, Within Sight).

Where this *Code* specifies that ~~one~~ equipment shall be “in sight from,” “within sight from,” or “within sight of” a building or structure, or of another equipment, the specified equipment shall be visible and not more than 15 m (50 ft) distant from the other.

Statement of Problem and Substantiation for Public Input

The addition of building or structure is needed as the term "within sight" is used in the Code for equipment that needs to be within sight of a building or structure. See 550.32(A) and 702.12(A) for example.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2005-NFPA 70-2023 [Definition: In Sight From (Within Sight From) (Within Sight...]	Similar Application of Term.

Submitter Information Verification

Submitter Full Name: Peter Diamond
Organization: Diamond Seminars
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 11 05:11:36 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9241-NFPA 70-2024
Statement: The term “within sight” is used in several sections of the NEC where the reference is a building or structure in addition to equipment.

Public Input No. 2384-NFPA 70-2023 [Section No. 110.29]

110.29 In Sight From (Within Sight From, Within Sight).

Where this *Code* specifies that one equipment shall be “in sight from,” “within sight from,” or “within sight of” another equipment, buidling, or structure, the specified equipment shall be visible and not more than 15 m (50 ft) distant from the other equipment, building, or structure .

Statement of Problem and Substantiation for Public Input

In 230.85 and 225.41 the emergency disconnecting means is required to be within sight of the dwelling unit. The definition is used in the context of having equipment being within sight of building or structures not only from other equipment. Revising the definition will help Code users understand how to apply the requirements better.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 15:43:42 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9241-NFPA 70-2024
Statement: The term “within sight” is used in several sections of the NEC where the reference is a building or structure in addition to equipment.

Public Input No. 3459-NFPA 70-2023 [Section No. 110.29]

110.29 In Sight From (Within Sight From, Within Sight).

Where this *Code* specifies that one equipment shall be "in sight from," "within sight from," or "within sight of" another equipment or a building or other structure , the specified equipment shall be visible and not more than 15 m (50 ft) distant from the other.

Statement of Problem and Substantiation for Public Input

The 2023 NEC text only recognized equipment that was in sight from other equipment. It did not take into consideration when the equipment was to be in sight from a building or other structure such as in 225.41(A)(1). The proposed text remedies that situation.

Submitter Information Verification

Submitter Full Name: Mark Hilbert
Organization: MR Hilbert Insp. & Training
Street Address:
City:
State:
Zip:
Submittal Date: Sun Sep 03 06:45:06 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9241-NFPA 70-2024
Statement: The term "within sight" is used in several sections of the NEC where the reference is a building or structure in addition to equipment.

Public Input No. 1356-NFPA 70-2023 [Section No. 110.31(A)(5)]

(5) Transformers.

Where a transformer is installed in a vault as required by Part II of Article 450, the vault shall be constructed in accordance with Part III of Article 450.

Informational Note No. 1: See ~~ANSI/~~ ASTM E119-~~2018a~~ 2022 , *Method for Fire Tests of Building Construction and Materials*, for additional information, and see NFPA 80-2019, *Standard for Fire Doors and Other Opening Protectives*.

Informational Note No. 2: A typical 3-hour construction is 150 mm (6 in.) thick reinforced concrete.

Statement of Problem and Substantiation for Public Input

All ASTM fire standards are ANSI standards and that does not need to be added (it is not included in other NEC references to ASTM standards). Also, it is important to reference the most recent edition of ASTM E119, which is dated 2022.

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 10 17:15:23 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9254-NFPA 70-2024
Statement: PI 3156) Reference to ANSI has been removed as all ASTM standards are ANSI standards and edition date of the standard has been revised.

(PI 2622) Text has been revised to comply with the NEC Style Manual.

Public Input No. 2622-NFPA 70-2023 [Section No. 110.31(A)(5)]

(5) Transformers.

Where a transformer is installed in a vault as required by ~~Part II of~~ Article 450, Part II, the vault shall be constructed in accordance ~~with Part III of Article 450~~ with Article 450, Part III .

Informational Note No. 1: See ANSI/ASTM E119-2018a, *Method for Fire Tests of Building Construction and Materials*, for additional information, and see NFPA 80-2019, *Standard for Fire Doors and Other Opening Protectives*.

Informational Note No. 2: A typical 3-hour construction is 150 mm (6 in.) thick reinforced concrete.

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: Wed Aug 23 21:11:14 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9254-NFPA 70-2024
Statement: PI 3156) Reference to ANSI has been removed as all ASTM standards are ANSI standards and edition date of the standard has been revised.

(PI 2622) Text has been revised to comply with the NEC Style Manual.

Public Input No. 2623-NFPA 70-2023 [Section No. 110.31(C)(1)]

(1) In Places Accessible to Unqualified Persons.

Outdoor electrical installations that are open to unqualified persons shall comply with ~~Part III of~~ Article 225, Part III .

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: Wed Aug 23 21:13:50 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9255-NFPA 70-2024
Statement: Text has been revised to comply with the NEC Style Manual.

Public Input No. 505-NFPA 70-2023 [Section No. 110.34(A)]

(A) Working Space.

Except as elsewhere required or permitted in this *Code,* equipment likely to require examination, adjustment, servicing, or maintenance while energized shall have clear working space in the direction of access to live parts of the electrical equipment and shall be not less than specified in Table 110.34(A). Distances shall be measured from the live parts, if such are exposed, or from the enclosure front or opening if such are enclosed. The grade, floor, or platform in the required working space shall be kept clear, and the floor, grade, or platform in the working space shall be as level and flat as practical for the entire depth and width of the working space.

Exception: Working space shall not be required in back of equipment such as switchgear or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum working space of 762 mm (30 in.) horizontally shall be provided.

Table 110.34(A) Minimum Depth of Clear Working Space at Electrical Equipment

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
1001–2500 V	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)
2501–9000 V	1.2 m (4 ft)	1.5 m (5 ft)	1.8 m (6 ft)
9001–25,000 V	1.5 m (5 ft)	1.8 m (6 ft)	2.8 m (9 ft)
25,001 V–75 kV	1.8 m (6 ft)	2.5 m (8 ft)	3.0 m (10 ft)
Above 75 kV	2.5 m (8 ft)	3.0 m (10 ft)	3.7 m (12 ft)

Note: Where the conditions are as follows:

Condition 1 — Exposed or enclosed live parts on one side of the working space and no exposed or enclosed live or grounded parts on the other side of the working space, or ~~exposed~~ live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 — Exposed or enclosed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed or enclosed live parts on both sides of the working space.

Statement of Problem and Substantiation for Public Input

Using the sole term exposed creates confusion when interpreting this code section. Most electrical equipment is guarded by an enclosure and therefore not Exposed.

Considering Conditions 1-3
Without this change simply using the term exposed, one can argue you do not need to meet these clear distances for panelboards within a cabinet

Submitter Information Verification

Submitter Full Name: Donald Fess
Organization:
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 22 12:28:24 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9256-NFPA 70-2024

Statement: The revision correlates with similar requirements of 110.26(A) and improves clarity. This revision logically accounts for the fact that enclosed equipment will need to meet the distances in each condition when equipment that is enclosed becomes exposed.

Public Input No. 1599-NFPA 70-2023 [Section No. 110.34(C)]

(C) Locked Rooms or Enclosures.

The entrance to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 1000 volts, nominal, shall be kept locked unless such entrances are under the observation of a qualified person at all times.

Permanent and conspicuous danger signs shall be provided. The danger sign shall meet the requirements in 110.21(B) and shall read as follows:

DANGER ~~— HIGH VOLTAGE — KEEP OUT~~ - [~~*INSERT ACTUAL NOMINAL SYSTEM VOLTAGE HERE*~~] ~~VOLTAGE — KEEP OUT~~

(Option 1 if PI-1577, PI-1592, & PI-1593 are accepted) - Informational Note: See Tables 110.4(A) and Table 110.4(B) for Standard Nominal System Voltages and Voltage Ranges.

(Option 2 if PI-1577, PI-1592, & PI-1593 are resolved) - Informational Note: For nominal voltage classifications and ratings, see ANSI C84.1, *Amercian National Standard for Electrical Power Systems and Equipment - Voltage Ratings (60 Hertz).*

Statement of Problem and Substantiation for Public Input

The NEC does not currently address required hazard warning/danger signs and markings in a manner consistent with industry standard ANSI C84 (which deals specifically with voltage classifications.
This revision is needed due to the NEC only addressing voltage levels at 1000 volts and less or above 1000 volts. The problem is that in many instances the current requirements for Danger High Voltage signage is inaccurate as the system the signage serves is not truly a "High Voltage" system per ANSI C84. Requiring signage that inaccuratley classifies an equipment's voltage system can create a hazard or confusion. For example, an electrical room containing a highest phase-to-phase voltage of 480 volts with a danger sign in the current NEC would read something like this: “DANGER HIGH VOLTAGE KEEP OUT” but to be technically correct and align with the industry standard ANSI C84 the sign would actually have to have text as follows: “DANGER LOW VOLTAGE KEEP OUT” which would not make much sense and confuse people. The proposed solution to include the actual system nominal voltage on these danger signs to increases accuracy and helps the NEC align more with industry standards regarding specific established voltage classifications as indicated in ANSI C84 Section 6, Table 1 as well as reduce confusion and misinformation. Companion PIs submitted adding tables in 110.4 mirroring the tables in ANSI C84 so installers have ready access to all standard nominal system voltages and voltage ranges.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1577-NFPA 70-2023 [Section No. 110.4]	
Public Input No. 1592-NFPA 70-2023 [New Section after 110.4]	
Public Input No. 1593-NFPA 70-2023 [New Section after 110.4]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 27 09:49:10 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Compliance with ANSI C84 is not mandatory in the NEC. Mandatory references to other standards are prohibited in the NEC per the NEC Style Manual,. Section 4.2.

Public Input No. 78-NFPA 70-2023 [Section No. 110.34(E)]

(E) Elevation of Unguarded Live Parts.

Unguarded live parts above working space shall be maintained at elevations not less than required by Table 110.34(E).

Table 110.34(E) Elevation of Unguarded Live Parts Above Working Space

Nominal Voltage Between Phases	Elevation	
	m	ft
1001–7500 V	2.7	9
7501–35,000 V	2.9	9 ft 6 in.
Over 35 kV	Add 9.5 mm per kV above 35 kV	Add 0.37 in. per kV above 35 kV

Informational note: see National Electrical Safety Code rule 124.A.3 for information regarding height of parts that may be normally energized at an indeterminate potential, such as ungrounded parts of insulators, bushings, or surge arresters; parts subject to elevated neutral-earth voltage or induction; or other ungrounded parts associated with elevated live parts.

Statement of Problem and Substantiation for Public Input

This table could lend itself to an interpretation that would require that the bottoms of bushings for dead tank circuit breakers installed in transmission voltage level customer owned substations (which are covered by the NEC) be elevated at heights which may exceed the manufacturer's standard. Such elevation may impede safe egress to the breaker's operations cabinet. The reference to the NESC's rule on elevation of these parts may provide clarity regarding the intent of table 110.34E.

Submitter Information Verification

Submitter Full Name: Josh Weaver
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 09 15:17:46 EST 2023
Committee: NEC-P01

Committee Statement

Resolution: Per 2.1.10.1, Usage of the NEC Style Manual: , “If an informational note is needed to explain the text of the document, consideration shall be given to rewriting the text of the document to make the rule clear.”

Public Input No. 3965-NFPA 70-2023 [Section No. 110.40]

~~Table~~

110.~~40~~ ~~Temperature Limitations at Terminations.~~

~~Conductors shall be permitted to be terminated based on the 90°C (194°F) temperature rating and ampacity as given in~~

40 Electrical Connections .

For equipment rated over 1000 Volts nominal, but not more than 2000 V nominal, that is connected using other than Type MV conductors, the requirements of 110.14 are applicable. For all equipment connected using Type MV conductors, the requirements of 110.40(A) through (E) supersede those of 110.14.

(A) General. Because of different characteristics of dissimilar metals, devices shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment. Connectors for more than one conductor shall be so identified.

Connectors and terminals for conductors shall be suitable for the conductor class or classes.

Where a listed Type MV Cable Joint or Type MV Cable Termination is supplied with a connector only the connection means supplied by the manufacturer shall be used for installation.

(B) Terminals. Connection of conductors to terminal parts shall ensure a mechanically secure electrical connection and shall be made by means of pressure connectors.

(C) Splices. Conductors shall be spliced with splicing devices identified for the use. All splices and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an identified insulating device. Wire connectors or splicing means installed on conductors for direct burial shall be listed for such use.

(D) Temperature Limitations. The temperature rating associated with the ampacity or temperature rating of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor, or device. Conductors with temperature ratings higher than specified for terminations shall be permitted to be used for ampacity adjustment, correction, or both.

(1) Equipment Provisions. Termination of conductors at equipment shall be based on the ampacity for MV-90 conductors as given in table 315.60 (C)(1) through

~~Table~~

table 315.60 (C)(20) , unless

~~otherwise identified.~~

the equipment and the connector assembly is identified for use with 105 °C conductors. The use of MV-105 conductors, sized based on the ampacity for MV-90 conductors, shall be permitted. -

(2) Separate Connector Provisions. Separately installed pressure connectors shall be used with conductors at the ampacities not exceeding the ampacity at the listed and identified temperature rating of the connector.

(E) Terminal Connection Torque. Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value.

Informational Note No.1: Examples of approved means of achieving the indicated torque values include torque tools or devices such as shear bolts or breakaway-style devices with visual indicators that demonstrate that the proper torque has been applied.

Informational Note No.2: See NFPA 70B-2019, Recommended practice for electrical equipment maintenance, for additional information for torquing threaded connections and terminations.

Additional Proposed Changes

File Name	Description	Approved

110.40.docx	Word document with changes (as TerraView version may be confusing with the formatting).

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of a Correlating Committee Task Group consisting of Robert Osborne (Chair), Paul Barnhart, Lou Grahor, Donny Cook, Scott Higgins, Mike Querry, Roger McDaniel, Dave Burns, Rod Belisle, Kevin Rogers, Tony Ricciuti, Paul Knapp, Paul Sullivan, George Smith, Eric Simmon, Kevin Arnold, Larry Wildermuth, and Kyle Krueger.

Section 110.40 has been revised to point to 110.14 as it applies to conductors up to 2000V. Appropriate Information related to Type MV conductors, which was not previously included in the requirement, has been added.

Submitter Information Verification

Submitter Full Name: Robert Osborne
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 11:28:19 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9258-NFPA 70-2024
Statement: Section 110.40 has been revised to point to 110.14 as it applies to conductors up to 2000V. Appropriate information related to Type MV conductors, which was not previously included in the requirement, has been added to Section 110.40.

The new section in 110.40(D) addresses the submitters concern.

110.40 Electrical Connections. ~~**Temperature Limitations on Terminations.** Conductors shall be permitted to be terminated based on the 90°C (194°F) temperature rating and ampacity as given in table 315.60 (C) (1) through table 315.60 (C) (20), unless otherwise Identified.~~

For equipment rated over 1000 Volts nominal, but not more than 2000 V nominal, that is connected using other than Type MV conductors, the requirements of 110.14 are applicable. For all equipment connected using Type MV conductors, the requirements of 110.40(A) through (E) supersede those of 110.14.

(A) General. Because of different characteristics of dissimilar metals, devices shall be identified for the material of the conductor and shall be properly installed and used. Conductors of dissimilar metals shall not be intermixed where physical contact occurs between dissimilar conductors unless the device is identified for the purpose and conditions of use. Materials such as solder, fluxes, inhibitors, and compounds, where employed, shall be suitable for the use and shall be of a type that will not adversely affect the conductors, installation, or equipment. Connectors for more than one conductor shall be so identified.

Connectors and terminals for conductors shall be suitable for the conductor class or classes.

Where a listed Type MV Cable Joint or Type MV Cable Termination is supplied with a connector only the connection means supplied by the manufacturer shall be used for installation.

(B) Terminals. Connection of conductors to terminal parts shall ensure a mechanically secure electrical connection and shall be made by means of pressure connectors.

(C) Splices. Conductors shall be spliced with splicing devices identified for the use. All splices and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an identified insulating device. Wire connectors or splicing means installed on conductors for direct burial shall be listed for such use.

(D) Temperature Limitations. The temperature rating associated with the ampacity or temperature rating of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor, or device. Conductors with temperature ratings higher than specified for terminations shall be permitted to be used for ampacity adjustment, correction, or both.

> **(1) Equipment Provisions.** Termination of conductors at equipment shall be based on the ampacity for MV-90 conductors as given in table 315.60 (C)(1) through table 315.60 (C)(20), unless the equipment and the connector assembly is identified for use with 105°C conductors. The use of MV-105 conductors, sized based on the ampacity for MV-90 conductors, shall be permitted.
>
> **(2) Separate Connector Provisions.** Separately installed pressure connectors shall be used with conductors at the ampacities not exceeding the ampacity at the listed and identified temperature rating of the connector.

(E) Terminal Connection Torque. Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value.

Informational Note No.1: Examples of approved means of achieving the indicated torque values include torque tools or devices such as shear bolts or breakaway-style devices with visual indicators that demonstrate that the proper torque has been applied.

Informational Note No.2: See NFPA 70B-2019, Recommended practice for electrical equipment maintenance, for additional information for torquing threaded connections and terminations.

Rationale:

This Public Input is submitted on behalf of a Correlating Committee Task Group consisting of Robert Osborne (Chair), Paul Barnhart, Lou Grahor, Donny Cook, Scott Higgins, Mike Querry, Roger McDaniel, Dave Burns, Rod Belisle, Kevin Rogers, Tony Ricciuti, Paul Knapp, Paul Sullivan, George Smith, Eric Simmon, Kevin Arnold, Larry Wildermuth, and Kyle Krueger.

Section 110.40 has been revised to point to 110.14 as it applies to conductors up to 2000V. Appropriate Information related to Type MV conductors, which was not previously included in the requirement, has been added.

Public Input No. 958-NFPA 70-2023 [Section No. 110.40]

110.40 Temperature Limitations at Terminations.

Conductors shall be permitted to be terminated based on the 90°C (194°F) temperature rating and ampacity as given in Table 315.60(C)(1) through Table 315.60(C)(20), unless otherwise identified.

The ampacity of conductors with a higher temperature ratings shall be determined based on the temperature rating of the termination based on the conductor size used.

Statement of Problem and Substantiation for Public Input

The current wording allows the use of a MV 105 conductor to be terminated on a termination that would only be rated for 90 degrees C. Which is OK except that the ampacity of the conductor should limited to the 90 degree C ampacity.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 06 14:51:49 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9258-NFPA 70-2024
Statement: Section 110.40 has been revised to point to 110.14 as it applies to conductors up to 2000V. Appropriate information related to Type MV conductors, which was not previously included in the requirement, has been added to Section 110.40.

The new section in 110.40(D) addresses the submitters concern.

Public Input No. 3685-NFPA 70-2023 [Section No. 110.41]

110.41 Inspections and Tests.

(Revised) 110.41 Inspection, Tests, and Documentation

(A) Pre-energization and Operating Tests.

Where required elsewhere in this *Code*, the complete electrical system design, including settings for protective, switching, and control circuits, shall be prepared in advance and made available on request to the authority having jurisdiction and shall be tested when first installed on-site.

(B) Test Report.

A test report covering the results of the tests required in 110.41(A) shall be available to the authority having jurisdiction prior to energization and made available to those authorized to install, operate, test, and maintain the system.

(NEW) (C) Documentation

All plans, specifications, drawings, details, and records shall be made available to the authority having jurisdiction for the electrical system as specified in 110.41(A). Documents shall be made available in either hard copy or digital format at the discretion of the AHJ.

Statement of Problem and Substantiation for Public Input

Missing documentation for the Electrical System Design is a common challenge to start an Electrical Equipment Maintenance program, having this requirement brings visibility and ownership to document the installation or the changes being made.

To help define various types of documentation the following reference is found in NFPA 915 for Remote Inspection which places the AHJ in control of what will be accepted.
NFPA 915 Remote inspection 4.7
4.7.1 All plans, specifications, drawings, details, and records shall be made available for the remote inspection or test as required.
4.7.2 Documents shall be made available in either hard copy or digital format at the discretion of the AHJ

Appropriate documentation to manage the electrical system is a key element to ensure reliability and safety. This reference is supporting NFPA 70B to ensure proper documentation for the electrical system is present for the on-going maintenance of Electrical Equipment. Section 6 of NFPA 70B defines that the following documentation should be available and maintained.
6.2 Single Line Diagrams
6.3 Coordination Studies
6.4 Short Circuit Studies
6.5 Load-Flow Studies
6.5 Reliability Studies
6.7 Incident Energy analysis (Arc Flash Study)

Submitter Information Verification

Submitter Full Name: Alan Schmidt
Organization: Schneider Electric
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 13:56:44 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The requirement for documentation is sufficiently addressed in 110.41(A).

Public Input No. 3769-NFPA 70-2023 [Section No. 110.51(A)]

(A) Covered.

This part shall apply to the installation and use of medium voltage and high-voltage power distribution and utilization equipment that is portable, mobile, or both, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, underground excavators, and the like.

Statement of Problem and Substantiation for Public Input

Where the voltage exceeds 1000 volts AC it is typically considered medium voltage up to 35KV and high voltage from 36KV to 220KV. Adding text to include medium voltage would help clarify that the requirement is also meant for medium voltage..

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 15:49:07 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9261-NFPA 70-2024
Statement: This correlates the requirement of what is covered in 110.51(A) with the title of Part IV of Article 110

Public Input No. 2624-NFPA 70-2023 [Section No. 110.52]

110.52 Overcurrent Protection.

Motor-operated equipment shall be protected from overcurrent in accordance with Article 430, Parts III, IV, and V ~~of Article 430~~ . Transformers shall be protected from overcurrent in accordance with 450.3.

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: Wed Aug 23 21:15:08 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9262-NFPA 70-2024
Statement: Text has been revised to comply with the NEC style manual.

Public Input No. 739-NFPA 70-2023 [Section No. 110.54(B)]

(B) Equipment Grounding Conductors.

An equipment grounding conductor shall be run with circuit conductors inside the ~~metal~~ outer surface of the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor shall be permitted to be insulated or bare. The metal raceway may be used as an equipment grounding conductor provided it meets 250.118.

Statement of Problem and Substantiation for Public Input

The old wording was ambiguous what counts as being inside the raceway. If the intent of the Code was to mean inside the surface of the raceway, then the raceway itself may be used as an equipment grounding conductor because it is always inside of itself and raceways typically have an ampacity much greater than that of the conductors it's enclosing.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 26 02:25:42 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision does not improve clarity or usability. It is unclear what is the “inside of an outer surface of a metal raceway.”

Public Input No. 2625-NFPA 70-2023 [Section No. 110.58]

110.58 Disconnecting Means.

A switch or circuit breaker that simultaneously opens all ungrounded conductors of the circuit shall be installed within sight of each transformer or motor location for disconnecting the transformer or motor. The switch or circuit breaker for a transformer shall have an ampere rating not less than the ampacity of the transformer supply conductors. The switch or circuit breaker for a motor shall comply with the applicable requirements of ~~Part IX of~~ Article 430 , Part IX .

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: Wed Aug 23 21:16:17 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9264-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. 1679-NFPA 70-2023 [Section No. 110.70]

110.70 General.

Electrical enclosures intended for personnel entry and specifically fabricated for this purpose shall be of sufficient size to provide safe work space about electrical equipment with live parts that is likely to require examination, adjustment, servicing, or maintenance while energized. Such enclosures shall have sufficient size to permit ready installation or withdrawal of the conductors employed without damage to the conductors or to their insulation. They shall comply with this part.

Electrical enclosure containing overcurrent devices shall have the clearance requirements defined in 110.26.

Exception: Where electrical enclosures covered by Part V of this article are part of an industrial wiring system operating under conditions of maintenance and supervision that ensure that only qualified persons monitor and supervise the system, they shall be permitted to be designed and installed in accordance with appropriate engineering practice. If required by the authority having jurisdiction, design documentation shall be provided.

Statement of Problem and Substantiation for Public Input

Manufactures tend to use this article to reduce the clearance in front of MCC that are install within a walk in enclosure that do not provide the clearances defined in article 110.26. The additional text would provide the end user of the equipment a safer environment by having the same clearances in front of the overcurrent devices as required in 110.26.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jul 28 16:03:33 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Inadequate technical substantiation is provided per the Regulations Governing the Development of NFPA Standards 4.3.4.1(d) and 4.3.4.2.

Public Input No. 3881-NFPA 70-2023 [Section No. 110.72]

110.72 Cabling Work Space.

A clear work space not less than 900 mm (3 ft) wide shall be provided where cables are located on both sides, and not less than 750 mm (2½ ft) where cables are only on one side. The vertical headroom shall be not less than 1.8 m (6 ft) unless the opening is within 300 mm (1 ft), measured horizontally, of the adjacent interior side wall of the enclosure.

Exception: A manhole containing only one or more of the following shall be permitted to have one of the horizontal work space dimensions reduced to 600 mm (2 ft) where the other horizontal clear work space is increased so the sum of the two dimensions is not less than 1.8 m (6 ft):

(1) Optical fiber cables

(2) Power-limited fire alarm circuits supplied in accordance with 760.121

(3) Class 2 or Class 3 remote-control and signaling circuits, or both, supplied in accordance with 725.60

(4) Class 4 Fault Managed Power circuits supplied in accordance with 726.121

Statement of Problem and Substantiation for Public Input

Class 4 circuits have at least the same fire and life safety requirements as a Class 2 circuits (and in some cases better). As such, this exception should also apply to Class 4 circuits.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 08:58:54 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9265-NFPA 70-2024
Statement: Class 4 circuits have at least the same fire and life safety requirements as a Class 2 circuits.

As such, Class 4 circuits have been added to the exception.

Public Input No. 3760-NFPA 70-2023 [New Section after 110.74(B)]

TITLE OF NEW CONTENT

(C) Enclosed Wiring.

All enclosed conductors and any splices or terminations, if present, shall be listed as suitable for wet locations.

Statement of Problem and Substantiation for Public Input

Underground raceways and enclosures are considered a wet location (300.5), however unlike the hand-hole requirements for splices and termination points to be wet rated (314.30(C) Man-hole's have no requirement to be wet rated. This new section would bring splice and termination points in line with a wet location requirements

Submitter Information Verification

Submitter Full Name: Alfio Torrisi
Organization: Triad National Security, LLC.
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 15:38:39 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: All listed equipment, including enclosed wiring, is already required to be used in accordance with its listing and labeling per 110.3(B)and 310.10(C)(3).

Public Input No. 1680-NFPA 70-2023 [Section No. 110.74(B)]

(B) Over 1000 Volts, Nominal.

Conductors operating at over 1000 volts shall be provided with bending space in accordance with ~~314.71(A) and (B)~~ 305.5 , as applicable.

Exception: Where 314.71(B) applies, each row or column of ducts on one wall of the enclosure shall be calculated individually, and the single row or column that provides the maximum distance shall be used.

Statement of Problem and Substantiation for Public Input

The reference to 314.71(A)&(B) is the incorrect reference. Article 314.71(A)&(B) is for the sizing of a box not the bending radius of a conductor. The correct reference should be 305.5.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jul 28 16:12:26 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9266-NFPA 70-2024
Statement: Reference to 314.71(A) an (B) has been corrected to 305.5 for the sizing of a box.

Public Input No. 3883-NFPA 70-2023 [Section No. 110.75(A)]

(A) Dimensions.

Rectangular access openings shall not be less than 650 mm × 550 mm (26 in. × 22 in.). Round access openings in a manhole shall be not less than 650 mm (26 in.) in diameter.

Exception: A manhole that has a fixed ladder that does not obstruct the opening or that contains only one or more of the following shall be permitted to reduce the minimum cover diameter to 600 mm (2 ft):

(1) Optical fiber cables

(2) Power-limited fire alarm circuits supplied in accordance with 760.121

(3) Class 2 or Class 3 remote-control and signaling circuits, or both, supplied in accordance with 725.60

(4) Class 4 Fault Managed Power circuits supplied in accordance with 726.121

Statement of Problem and Substantiation for Public Input

Class 4 circuits have at least the same fire and life safety requirements as a Class 2 circuits (and in some cases better). As such, this exception should also apply to Class 4 circuits.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 09:02:41 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9268-NFPA 70-2024
Statement: Class 4 circuits have at least the same fire and life safety requirements as a Class 2 circuits.

As such, Class 4 circuits have been added to the exception.

Public Input No. 3765-NFPA 70-2023 [Section No. 110.75(C)]

(C) Location.

Manhole openings for personnel shall be located where they are not directly above electrical equipment or conductors ~~in~~ inside the manhole enclosure. Where this is not practicable, either a protective barrier or a fixed ladder shall be provided.

Statement of Problem and Substantiation for Public Input

the current wording assumes the user understands that the reference is to equipment and conductors inside the MH enclosure. The suggested wording would clarify that it is referencing equipment and conductors inside the MH enclosure.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 15:43:37 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9269-NFPA 70-2024
Statement: The revised text clarifies the application of the requirement.

Public Input No. 3761-NFPA 70-2023 [Section No. 110.76(A)]

(A) Location.

Access openings for personnel shall be located where they ~~are not directly above~~ do inhibit access to the electrical equipment or conductors in the enclosure. Other openings shall be permitted over equipment to facilitate installation, maintenance, or replacement of equipment.

Statement of Problem and Substantiation for Public Input

The current wording seems to indicate that the access to the tunnel or vault would be above the equipment which may or may not be true. The tunnel or vault may also be below the equipment. The suggested change would accommodate for either type of installation.

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 15:40:12 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed change would inhibit access to enclosed equipment.

Public Input No. 3759-NFPA 70-2023 [Section No. 110.77]

110.77 Ventilation.

Where manholes, tunnels, and vaults have communicating openings into enclosed areas used by the public, ventilation ~~to~~ from the enclosed area to open air shall be provided wherever practicable.

Statement of Problem and Substantiation for Public Input

The current wording does not define what the ventilation is to be provided for. Is it for the MH or the enclosed area?

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 05 15:36:13 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: The proposed revision would not add clarity or improve usability. The requirement is clear that the ventilation through the communicating openings from the manhole is to be to open air.

Public Input No. 2589-NFPA 70-2023 [Annex A]

Informative Annex A Product Safety Standards

Informative Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only.

This informative annex provides a list of product safety standards used for product listing where that listing is required by this *Code*. It is recognized that this list is current at the time of publication but that new standards or modifications to existing standards can occur at any time while this edition of the *Code* is in effect.

This informative annex does not form a mandatory part of the requirements of this *Code* but is intended to identify for the *Code* users the standards upon which *Code* requirements have been based.

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

Article	Standard Number	Standard Title
	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
	UL 248-4	Low-Voltage Fuses — Part 4: Class CC Fuses
	UL 248-5	Low-Voltage Fuses — Part 5: Class G Fuses
	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
	UL 248-11	Low-Voltage Fuses — Part 11: Plug Fuses
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses
	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
	UL 489I	Solid State Molded-Case Circuit Breakers
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 4248-1	Fuseholders — Part 1: General Requirements
242	UL 1449	Surge Protective Devices
250	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

Article	Standard Number	Standard Title
	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 93ºC and Copper-to-Copper Conductors Designed for Normal Operation at or Below 100ºC
	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

Article	Standard Number	Standard Title
	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
	UL 1953	Power Distribution Blocks
320	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

Article	Standard Number	Standard Title
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
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	UL 498M	Marine Shore Power Inlets
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	UL 746C	Polymeric Materials — Use in Electrical Equipment Evaluations
	UL 943	Ground-Fault Circuit-Interrupters
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	UL 917	Clock-Operated Switches
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	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection
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	UL 498M	Marine Shore Power Inlets
	UL 514A	Metallic Outlet Boxes
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409	UL 508	Industrial Control Equipment
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410	ANSI/CSA-C22.2 No. 184.2	Solid-State Controls for Lighting Systems (SSCLS)
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	UL 496	Lampholders
	UL 498	Attachment Plugs and Receptacles
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	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
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	UL 498	Attachment Plugs and Receptacles
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	UL 2021	Fixed and Location-Dedicated Electric Room Heaters
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	UL 60745-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements
	UL 60745-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills
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	UL 60745-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders
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	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters
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	UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws
	UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular requirements for Transportable Cut-Off Machines
	UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular requirements for Transportable Threading Machines
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	UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular requirements for Transportable Drain Cleaners
	UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers
	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws
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	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters
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	UL 1004-4	Electric Generators
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450	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 305	Panic Hardware
	UL 340	Tests for Comparative Flammability of Liquids
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric Actuators
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	UL 305	Panic Hardware
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	UL 4127	Low Voltage Battery Cable
	UL 4128	Intercell and Intertier Connectors for use in Electrochemical Battery System Applications
490	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 347A	Medium Voltage Power Conversion Equipment
	UL 347B	Medium Voltage Motor Controllers, Up to 15kV
	UL 347C	Medium Voltage Solid State Resistive Load Controllers, Up to 15kV
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
500	FM 121303	Guide for Use of Detectors for Flammable Gases
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	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 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations

Article	Standard Number	Standard Title
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation.
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
	UL 121303	Guide for Use of Detectors for Flammable Gases
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids
501	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Standard for Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1072	Medium-Voltage Power Cables
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members
	UL 1309A	Cable for Use in Mobile Applications
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2,

Article	Standard Number	Standard Title
		Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids
502	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1309A	Cable for Mobile Installations
	UL 1836	Outline of Investigation for Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Part 30-1: Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
503	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	UL 823	Standard for Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations

Article	Standard Number	Standard Title
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
504	UL 698A	Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
	UL 120202	Recommendations for the Preparation, Content, and Organization of Intrinsic Safety Control Drawings
505	FM 121303	Guide for Use of Detectors for Flammable Gases
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	UL 1309A	Cable for Mobile Installations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements
	UL 60079-1	Explosive Atmospheres — Part 1: Equipment Protection by Flameproof Enclosures “d”
	UL 60079-2	Explosive Atmospheres — Part 2: Equipment protection by pressurized enclosure “p”
	UL 60079-5	Explosive Gas Atmospheres — Part 5: Type of Protection — Powder Filling “q”
	UL 60079-6	Explosive Atmospheres — Part 6: Equipment Protection by Liquid Immersion “o”
	UL 60079-7	Explosive Atmospheres — Part 7: Equipment Protection by Increased Safety “e”
	UL 60079-10-1	Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive Gas Atmospheres
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety “i”
	UL 60079-13	Explosive Atmospheres — Part 13: Equipment Protection by Pressurized Room “p” and Artificially Ventilated Room “v”
	UL 60079-15	Explosive Atmospheres — Part 15: Equipment Protection by Type of Protection “n”
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems
	UL 60079-26	Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Explosive Atmospheres — Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”

Article	Standard Number	Standard Title
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety “c”, Control of Ignition Source “b”, Liquid Immersion “k”
	UL 121303	Guide for Use of Detectors for Flammable Gases
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids
506	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements
	UL 60079-2	Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure “p”
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety "i"
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-30-1	Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-31	Explosive Atmospheres — Part 31: Equipment Dust Ignition Protection by Enclosure “t”
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 62784	Vacuum Cleaners and Dust Extractors Providing Equipment Protection Level Dc for the Collection of Combustible Dusts — Particular Requirements
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety “c”, Control of Ignition Source “b“, Liquid Immersion “k”
512	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations
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
517	AAMI ES 60601-1	Medical electrical equipment — Part 1: General requirements for basic safety and essential performance
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	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

Article	Standard Number	Standard Title
	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 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 1022	Line Isolation Monitors
	UL 1047	Isolated Power Systems Equipment
	UL 1286	Office Furnishing Systems
	UL 2930	Cord-and-Plug-connected Health Care Facility Outlet Assemblies
	UL 60601-1	Medical Electrical Equipment — Part 1: General Requirements for Safety
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids
518	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 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 2305	Exhibition Display Units, Fabrication and Installation
	UL 2305A	Convention Center Cord Sets
520	UL 62	Flexible Cords and Cables
	UL 334	Theater Lighting Distribution and Control Equipment
	UL 1573	Stage and Studio Luminaires and Connector Strips
	UL 1640	Portable Power-Distribution Equipment
	UL 1691	Single Pole Locking-Type Separable Connectors
522	UL 13	Power Limited Circuit Cables
	UL 1063	Machine-Tool Wires and Cables
	UL 2250	Instrumentation Tray Cable
525	UL 62	Flexible Cords and Cables
	UL 817	Cord Sets and Power-Supply Cords
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1691	Single Pole Locking-Type Separable Connectors
530	UL 62	Flexible Cords and Cables
	UL 1479	Fire Tests of Penetration Firestops
	UL 1573	Stage and Studio Luminaires and Connector Strips
	UL 1680	Stage and Lighting Cables
	UL 1691	Single Pole Locking-Type Separable Connectors
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
540	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
545	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 5B	Strut-Type Channel Raceways and Fittings
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
	UL 20	General Use Snap Switches
	UL 209	Cellular Metal Floor Raceways and Fittings
	UL 498	Attachment Plugs and Receptacles
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts

Article	Standard Number	Standard Title
	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 514A	Metallic Outlet Boxes
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 2024	Cable Routing Assemblies and Communications Raceways
547	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 62	Flexible Cords and Cables
	UL 514A	Metallic Outlet Boxes
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 1598	Luminaires
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
550	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 307A	Liquid Fuel-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles
	UL 307B	Gas-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	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 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1462	Mobile Home Pipe Heating Cable
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2108	Low-Voltage Lighting Systems
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
551	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 62	Flexible Cords and Cables
	UL 231	Power Outlets
	UL 234	Low Voltage Lighting Fixtures for use in Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 467	Grounding and Bonding Equipment
	UL 486C	Splicing Wire Connectors
	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 514A	Metallic Outlet Boxes

Article	Standard Number	Standard Title
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1008	Transfer Switch Equipment
	UL 1008M	Transfer Switch Equipment, Meter Mounted
	UL 1008S	Solid-State Transfer Switches
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1449	Surge Protective Devices
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2200	Stationary Engine Generator Assemblies
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 60730-1	Automatic Electrical Controls; Part 1: General Requirements
	UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls
552	SAE J1128-2015	Low Voltage Primary Cable, for Types GXL, HDT, and SXL
	SAE J1127-2015	Low Voltage Battery Cable, for Types SGT and SGR
	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 62	Flexible Cords and Cables
	UL 67	Panelboards
	UL 231	Power Outlets
	UL 234	Low Voltage Lighting Fixtures for Use in Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 430	Waste Disposers
	UL 467	Grounding and Bonding Equipment
	UL 514A	Metallic Outlet Boxes
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 916	Energy Management Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2108	Low Voltage Lighting Systems
	UL 2200	Stationary Engine Generator Assemblies
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
555	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 231	Power Outlets
	UL 486D	Sealed Wire Connector Systems
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 676	Underwater Luminaires and Submersible Junction Boxes

Article	Standard Number	Standard Title
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
	UL 1650	Portable Power Cable
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
590	UL 496	Lampholders
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 588	Seasonal and Holiday Decorative Products
	UL 817	Cord Sets
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1088	Temporary Lighting Strings
	UL 1377	Wire used in Low Voltage Seasonal Lighting Products In Circuits With a Maximum Available Power of 15W
600	UL 1	Flexible Metal Conduit
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 13	Power-Limited Circuit Cables
	UL 48	Electric Signs
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems
	UL 814	Gas-Tube-Sign Cable
	UL 879	Electric Sign Components
	UL 879A	LED Sign and Sign Retrofit Kits
	UL 879B	Polymeric Enclosure Systems for the Splice Between Neon Tubing Electrode Leads and GTO Cable, and the GTO Cable Leading to the Splice
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1310	Class 2 Power Units
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection
	Ul 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2161	Neon Transformers and Power Supplies
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
	UL 3001	Distributed Energy Generation and Storage Systems
	UL 3003	Distributed Generation Cables
	UL 3703	Solar Trackers
	UL 4703	Photovoltaic Wire
	UL 6703	Connectors for Use in Photovoltaic Systems
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings
	UL 8703	Concentrator Photovoltaic Modules and Assemblies
	UL 9703	Distributed Generation Wiring Harnesses
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements For Construction

Article	Standard Number	Standard Title
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements For Testing
	UL 62109	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
604	UL 1	Flexible Metal Conduit
	UL 4	Armored Cable
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 5B	Strut-Type Channel Raceways and Fittings
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
	UL 62	Flexible Cords and Cables
	UL 183	Manufactured Wiring Systems
	UL 209	Cellular Metal Floor Raceways and Fittings
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 797	Electrical Metallic Tubing — Steel
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel
	UL 857	Busways
	UL 1569	Metal-Clad Cables
	UL 2024	Cable Routing Assemblies and Communications Raceways
605	UL 962	Household and Commercial Furnishings
	UL 1286	Office Furnishings Systems
	UL 1310	Class 2 Power Units
	UL 2999	Individual Commercial Office Furnishings
	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
610	UL 62	Flexible Cords and Cables
	UL 2273	Festoon Cable
620	UL 62	Flexible Cords and Cables
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 98	Enclosed and Dead-Front Switches
	UL 104	Elevator Door Locking Devices and Contacts
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 508A	Industrial Control Panels
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1310	Class 2 Power Units
	UL 1449	Surge Protective Devices
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 2556	Wire and Cable Test Methods
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
625	UL 62	Flexible Cords And Cables
	UL 1650	Portable Power Cable
	UL 2202	Electric Vehicle (EV) Charging System Equipment
	UL 2231-1	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 1: General Requirements
	UL 2231-2	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 2: Particular Requirements for Protection Devices for Use in Charging Systems

Article	Standard Number	Standard Title
	UL 2251	Plugs, Receptacles and Couplers for Electrical Vehicles
	UL 2580	Batteries for Use in Electric Vehicles
	UL 2594	Electric Vehicle Supply Equipment
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)
626	UL 62	Flexible Cords and Cables
	UL 231	Power Outlets
	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 817	Cord Sets and Power-Supply Cords
	UL 1651	Optical Fiber Cable
	UL 1686	Pin and Sleeve Configurations
630	UL 551	Transformer-Type Arc-Welding Machines
640	UL 13	Power Limited Circuit Cables
	UL 62	Flexible Cords and Cables
	UL 813	Commercial Audio Equipment
	UL 1310	Class 2 Power Units
	UL 1419	Professional Video and Audio Equipment
	UL 1492	Audio-Video Products and Accessories
	UL 1711	Amplifiers for Fire Protective Signaling Systems
	UL 2269	Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes
	UL 6500	Audio/Video and Musical Instrument Apparatus for Household, Commercial, and Similar General Use
	UL 60065	Audio, Video and Similar Electronic Apparatus — Safety Requirements
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
645	UL 38	Manual Signaling Boxes for Fire Alarm Systems
	UL 268	Smoke Detectors for Fire Alarm Systems
	UL 444	Communications Cables
	UL 464	Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
	UL 497B	Protectors for Data Communications and Fire Alarm Circuits
	UL 833	Control Units and Accessories for Fire Alarm Systems
	UL 864	Control Units and Accessories for Fire Alarm Systems
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits
	UL 1425	Cables for Non-Power-Limited Fire-Alarm Circuits
	UL 1449	Surge Protective Devices
	UL 1480	Speakers for Fire Alarm and Signaling Systems, Including Accessories
	UL 1638	Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
	UL 1651	Optical Fiber Cable
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 1690	Data-Processing Cable
	UL 1778	Uninterruptible Power Systems
	UL 2024	Cable Routing Assemblies and Communications Raceways
	UL 60950-1	Information Technology Equipment Safety — Part 1: General Requirements
	UL 60950-21	Information Technology Equipment Safety — Part 21: Remote Power Feeding
	UL 60950-22	Information Technology Equipment Safety — Part 22: Equipment to be Installed Outdoors

Article	Standard Number	Standard Title
	UL 60950-23	Information Technology Equipment Safety — Part 23: Large Data Storage Equipment
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
646	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 62	Flexible Cords and Cables
	UL 67	Panelboards
	UL 98	Enclosed and Dead-Front Switches
	UL 305	Panic Hardware
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 508A	Industrial Control Panels
	UL 845	Motor Control Centers
	UL 869A	Reference Standard for Service Equipment
	UL 891	Switchboards
	UL 924	Emergency Lighting and Power Equipment
	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 1062	Unit Substations
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1429	Pullout Switches
	UL 1449	Surge Protective Devices
	UL 1655	Community-Antenna Television Cables
	UL 1989	Standby Batteries
	UL 2755	Modular Data Centers
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
647	UL 1598	Luminaires
650	UL 1310	Class 2 Power Units
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
670	ANSI/CSA-C22.2 No. 19085-1	Woodworking machines — Safety — Part 1: Common requirements
	UL 508	Industrial Control Equipment
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
675	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
680	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 20	General Use Snap-Switches
	UL 62	Flexible Cords and Cables
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 379	Power Units for Fountain, Swimming Pool, and Spa Luminaires

Article	Standard Number	Standard Title
	UL 467	Grounding and Bonding Equipment
	UL 486D	Sealed Wire Connector Systems
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 676	Underwater Luminaires and Submersible Junction Boxes
	UL 676A	Potting Compounds for Swimming Pool, Fountain, and Spa Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1004-10	Pool Pump Motors
	UL 1081	Swimming Pool Pumps, Filters, and Chlorinators
	UL 1241	Junction Boxes for Swimming Pool Luminaires
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1261	Electric Water Heaters for Pools and Tubs
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment
	UL 1569	Metal-Clad Cables
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 1795	Hydromassage Bathtubs
	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 2452	Electric Swimming Pool and Spa Cover Operators
	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
	UL 2995	Lifts for Swimming Pools and Spas
	UL 60335-2-1000	Household and Similar Electrical Appliances: Particular Requirements for Electrically Powered Pool Lifts
682	UL 486D	Sealed Wire Connector Systems
	UL 1650	Portable Power Cable
	UL 1838	Low Voltage Landscape Lighting Systems
690	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses
	UL 467	Grounding and Bonding Equipment
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems
	UL 1569	Metal-Clad Cables
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection
	UL 1703	Flat-Plate Photovoltaic Modules and Panels
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
	UL 3001	Distributed Energy Generation and Storage Systems
	UL 3003	Distributed Generation Cables
	UL 3005	Distributed Energy Resource Management Systems
	UL 3703	Solar Trackers
	UL 3730	Photovoltaic Junction Boxes
	UL 3741	Photovoltaic Hazard Control
	UL 4703	Photovoltaic Wire
	UL 6703	Connectors for Use in Photovoltaic Systems
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings

Article	Standard Number	Standard Title
	UL 8703	Concentrator Photovoltaic Modules and Assemblies
	UL 8801	Photovoltaic Luminaire Systems
	UL 9703	Distributed Generation Wiring Harnesses
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements for Construction
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements for Testing
	UL 62109-1	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
692	UL 2262	Fuel Cell Modules for Use in Portable and Stationary Equipment
	UL 2262A	Borohydride Fuel Cartridges with Integral Fuel Processing for Use with Portable Fuel Cell Power Systems or Similar Equipment
	UL 2265	Fuel Cell Power Units and Fuel Storage Containers for Portable Devices
	UL 2265A	Hand-held or Hand-Transportable Fuel Cell Power Units with Disposable Methanol Fuel Cartridges for use in Original Equipment Manufacturer's Information Technology Equipment
	UL 2265C	Hand-Held or Hand-Transportable Alkaline (Direct Borohydride) Fuel Cell Power Units and Borohydride Fuel Cartridges For Use With Consumer Electronics or Information Technology Equipment
	UL 2266	Electromagnetic Compatibility, Electrical Safety, and Physical Protection of Stationary and Portable Fuel Cell Power Systems for Use with Commercial Network Telecommunications Equipment
	UL 2267	Fuel Cell Power Systems for Installation in Industrial Electric Trucks
694	UL 467	Grounding and Bonding Equipment
	UL 489C	Molded-Case Circuit Breakers and Molded-Case Switches for Use with Wind Turbines
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2227	Flexible Motor Supply Cable and Wind Turbine Tray Cable
	UL 2736	Single Pole Separable Interconnecting Cable Connectors for Use with Wind Turbine Generating Systems
	UL 4143	Wind Turbine Generator — Life Time Extension (LTE)
	UL 6141	Wind Turbines Permitting Entry of Personnel
	UL 6142	Wind Turbine Generating Systems — Small
695	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 218	Fire Pump Controllers
	UL 448	Centrifugal Stationary Pumps for Fire-Protection Service
	UL 448B	Residential Fire Pumps Intended for One- and Two-Family Dwellings and Manufactured Homes
	UL 448C	Stationary, Rotary-Type, Positive-Displacement Pumps for Fire Protection Service
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 1004-5	Fire Pump Motors
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1569	Metal-Clad Cables
	UL 1724	Fire Tests for Electrical Circuit Protective Systems
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
700	UL 924	Emergency Lighting and Power Equipment

Article	Standard Number	Standard Title
	UL 1008	Transfer Switch Equipment
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
	UL 1449	Surge Protective Devices
	UL 1724	Fire Tests for Electrical Circuit Protective Systems
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 2200	Stationary Engine Generator Assemblies
701	UL 924	Emergency Lighting and Power Equipment
	UL 1008	Transfer Switch Equipment
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
702	UL 98	Enclosed and Dead-Front Switches
	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
705	UL 62	Flexible Cords and Cables
	UL 98	Enclosed and Dead-Front Switches
	UL 486D	Sealed Wire Connector Systems
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1429	Pullout Switches
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2200	Stationary Engine Generator Assemblies
	UL 3003	Distributed Generation Cables
	UL 6141	Wind Turbines Permitting Entry of Personnel
	UL 6142	Small Wind Turbine Systems
	UL 9540	Energy Storage Systems and Equipment
	UL 62109-2	Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters
706	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 248-6	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
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses
	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
	UL 489H	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures, for Use with Direct Current (DC) Microgrids
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 9540	Energy Storage Systems and Equipment

Article	Standard Number	Standard Title
708	UL 1	Flexible Metal Conduit
	UL 4	Armored Cable
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 497A	Secondary Protectors for Communications Circuits
	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 1569	Metal-Clad Cables
	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
	UL 2200	Stationary Engine Generator Assemblies
	UL 8801	Photovoltaic Luminaire Systems
	UL 9540	Energy Storage Systems and Equipment
	UL 62109-1	Power Converters for use in Photovoltaic Power Systems — Part 1: General Requirements
	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
	UL 444	Standard for Safety for Communications Cables
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits
	UL 1651	Optical Fiber Cable
	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

Article	Standard Number	Standard Title
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	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
	UL 9990	Information and Communication Technology (ICT) Power Cables
	UL 61010-2-201	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-201: Particular Requirements for Control Equipment
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
	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
	UL 1400-2	Fault-Managed Power Systems — Part 2 Requirements for Cables
	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
	UL 2556	Wire and Cable Test Methods
728	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	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
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables

Article	Standard Number	Standard Title
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric Actuators
770	UL 467	Grounding and Bonding Equipment
	UL 568	Nonmetallic Cable Tray Systems
	UL 1651	Optical Fiber Cable
	UL 2024	Optical Fiber and Communication Cable Raceway
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
800	UL 444	Communications Cables
	UL 467	Grounding and Bonding Equipment
	UL 489A	Circuit Breakers for Use in Communication Equipment
	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
	UL 568	Nonmetallic Cable Tray Systems
	UL 723	Test for Surface Burning Characteristics of Building Materials
	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
	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
	UL 719	Nonmetallic-Sheathed Cables
	UL 1310	Class 2 Power Units
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 1863	Communication Circuit Accessories
	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
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
810	UL 150	Antenna Rotators
	UL 452	Antenna-Discharge Units
	UL 467	Grounding and Bonding Equipment
	UL 497E	Protectors for Antenna Lead-In Conductors
820	UL 444	Communications Cables
	UL 497E	Protectors for Antenna Lead-In Conductors
	UL 1655	Community-Antenna Television Cables
830	UL 444	Communications Cables
	UL 497A	Secondary Protectors for Communications Circuits

Article	Standard Number	Standard Title
	UL 497C	Protectors for Coaxial Communications Circuits
	UL 497E	Protectors for Antenna Lead-In Conductors
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
840	UL 444	Communications Cables
	UL 467	Grounding and Bonding Equipment
	UL 498A	Current Taps and Adapters
	UL 1310	Class 2 Power Units
	UL 1651	Optical Fiber Cable
	UL 1863	Communication Circuit Accessories
	UL 2024	Cable Routing Assemblies and Communications Raceways
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
Tables 11(A) and 11(B)	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
Tables 12(A) and 12(B)	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

Article	Standard Number	Standard Title
	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
	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

Article	Standard Number	Standard Title
	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

Article	Standard Number	Standard Title
	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

Article	Standard Number	Standard Title
	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
	NFPA 88A	Standard for Parking Structures
512	ICC IFC	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
	NFPA 409	Standard on Aircraft Hangars
514	NFPA 2	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

Article	Standard Number	Standard Title
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

File Name	Description	Approved
Annex_A_-_Master_-_Final_PI.docx	Annex A - Standards additions and deletions	

Statement of Problem and Substantiation for Public Input

This revision identifies updates to Annex A for all relevant product safety standards for conductors and equipment that have an associated listing requirement in Part A.1(a) and ones that do not have an associated listing requirement in Part A.1(b). It is understood that NFPA has a requirement for the Edition and Date of each standard. This will be addressed in a separate Public Input to be submitted by UL Standards and Engagement.

Submitter Information Verification

Submitter Full Name: Kenneth McKinney
Organization: UL LLC
Street Address:

City:
State:
Zip:
Submittal Date: Wed Aug 23 12:56:25 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9025-NFPA 70-2024
Statement: The informative Annex A was revised to include new standards, delete withdrawn standards, and update the edition years in compliance with the NEC Style Manual and the Regulations Governing the Development of NFPA Standards.

Annex A

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

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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
	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
	UL 248-4	Low-Voltage Fuses — Part 4: Class CC Fuses
	UL 248-5	Low-Voltage Fuses — Part 5: Class G Fuses
	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
	UL 248-11	Low-Voltage Fuses — Part 11: Plug Fuses
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses
	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
240	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-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 4248-1	Fuseholders — Part 1: General Requirements
242	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 153	Portable Electric Luminaires
	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
250	UL 514A	Metallic Outlet Boxes

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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 83B	Switchboard and Switchgear Wires and Cables
	UL 224	Extruded Insulating Tubing
	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 854	Service-Entrance Cables
	UL 1063	Machine-Tool Wires and Cables
	UL 1441	Coated Electrical Sleeving
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
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
	UL 1953	Power Distribution Blocks
315	ANSI C119.4	Electric Connectors — Connectors for Use between Aluminum-to-Aluminum and Aluminum-to-Copper Conductors Designed

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		for Normal Operation at or Below 93ºC and Copper-to-Copper Conductors Designed for Normal Operation at or Below 100ºC
	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
320	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

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 854	Service-Entrance Cables
340	UL 514B	Conduit, Tubing, and Cable Fittings
	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 HDPE 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

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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-Interrupters
	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-Interrupters
	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

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 60730-2	Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches
	UL 60730-2-7	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 1699A	Outlet Branch Circuit AFCIs See 406.4(D)(4)(1)
	UL 1053	Ground-Fault Sensing and Relaying Equipment See 406.4(D)(8)
	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-Interrupters
	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

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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
	UL 1310	Class 2 Power Units
411	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
	UL 122	Photographic Equipment
	UL 141	Garment Finishing Appliances
	UL 174	Household Electric Storage Tank Water Heaters
	UL 197	Commercial Electric Cooking Appliances
	UL 283	Air Fresheners and Deodorizers
	UL 399	Drinking Water Coolers
	UL 430	Waste Disposers
	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 499	Electric Heating Appliances
	UL 507	Electric Fans
	UL 514A	Metallic Outlet Boxes
	UL 515	Electric Resistance Trace Heating for Commercial Applications
	UL 561	Floor Finishing Machines
	UL 574	Electric Oil Heaters
	UL 621	Ice Cream Makers
	UL 705	Power Ventilators
	UL 710B	Recirculating Systems
	UL 749	Household Dishwashers
	UL 751	Vending Machines
	UL 763	Motor-Operated Commercial Food Preparing Machines
	UL 778	Motor-Operated Water Pumps
	UL 834	Heating, Water Supply, and Power Boilers — Electric
	UL 858	Household Electric Ranges
	UL 859	Household Electric Personal Grooming Appliances
	UL 875	Electric Dry-Bath Heaters
	UL 921	Commercial Dishwashers
	UL 923	Microwave Cooking Appliances
	UL 943	Ground-Fault Circuit-Interrupters
	UL 962	Household and Commercial Furnishings
	UL 962A	Furniture Power Distribution Units
	UL 979	Water Treatment Appliances
	UL 982	Motor-Operated Household Food Preparing Machines

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 987	Stationary and Fixed Electric Tools
	UL 1017	Vacuum Cleaners, Blower Cleaners, and Household Floor Finishing Machines
	UL 1026	Household Electric Cooking and Food Serving Appliances
	UL 1086	Household Trash Compactors
	UL 1090	Electric Snow Movers
	UL 1206	Electric Commercial Clothes-Washing Equipment
	UL 1240	Electric Commercial Clothes-Drying Equipment
	UL 1278	Movable and Wall- or Ceiling-Hung Electric Room Heaters
	UL 1447	Electric Lawn Mowers
	UL 1450	Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment
	UL 1453	Electric Booster and Commercial Storage Tank Water Heaters
	UL 1576	Flashlights and Lanterns
	UL 1594	Sewing and Cutting Machines
	UL 1647	Motor-Operated Massage and Exercise Machines
	UL 1727	Commercial Electric Personal Grooming Appliances
	UL 1776	High-Pressure Cleaning Machines
	UL 2157	Electric Clothes Washing Machines and Extractors
	UL 2158	Electric Clothes Dryers
	UL 2565	Industrial Metalworking and Woodworking Machine Tools
	UL 60335-2-3	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electric Irons
	UL 60335-2-8	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Shavers, Hair Clippers, and Similar Appliances
	UL 60335-2-24	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances, and Ice-Makers
	UL 60335-2-40	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers
	UL 60335-2-67	Household and Similar Electrical Appliances — Safety — Part 2-67: Particular Requirements for Floor Treatment Machines, For Commercial Use
	UL 60335-2-68	Household and Similar Electrical Appliances — Safety — Part 2-68: Particular Requirements for Spray Extraction Machines, for Commercial Use
	UL 60335-2-79	Household and Similar Electrical Appliances — Safety — Part 2-79: Particular Requirements for High Pressure Cleaners and Steam Cleaners
	UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls
	UL 60745-1	Hand-Held Motor-Operated Electric Tools — Safety — Part 1: General Requirements
	UL 60745-2-1	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-1: Particular Requirements for Drills and Impact Drills
	UL 60745-2-2	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-2: Particular Requirements for Screwdrivers and Impact Wrenches
	UL 60745-2-3	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-3: Particular Requirements for Grinders, Polishers, and Disk-Type Sanders
	UL 60745-2-4	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type
	UL 60745-2-5	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-5: Particular Requirements for Circular Saws
	UL 60745-2-6	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-6: Particular Requirements for Hammers
	UL 60745-2-8	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-8: Particular Requirements for Shears and Nibblers
	UL 60745-2-9	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-9: Particular Requirements for Tappers
	UL 60745-2-11	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		11: Particular Requirements for Reciprocating Saws
	UL 60745-2-12	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-12: Particular Requirements For Concrete Vibrators
	UL 60745-2-13	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-13: Particular Requirements For Chain Saws
	UL 60745-2-14	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-14: Particular Requirements for Planers
	UL 60745-2-15	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-15: Particular Requirements for Hedge Trimmers
	UL 60745-2-16	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-16: Particular Requirements for Tackers
	UL 60745-2-17	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-17: Particular Requirements for Routers and Trimmers
	UL 60745-2-18	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-18: Particular Requirements For Strapping Tools
	UL 60745-2-19	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-19: Particular Requirements for Jointers
	UL 60745-2-20	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-20: Particular Requirements for Band Saws
	UL 60745-2-21	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-21: Particular Requirements For Drain Cleaners
	UL 60745-2-22	Hand-Held Motor-Operated electric Tools — Safety — Part 2-22: Particular Requirements for Cut-Off Machines
	UL 60745-2-23	Hand-Held Motor-Operated electric Tools — Safety — Part 2-23: Particular Requirements for Die Grinders and Small Rotary Tools
	UL 62841-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements
	UL 62841-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills
	UL 62841-2-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-2: Particular Requirements For Screwdrivers And Impact Wrenches
	UL 62841-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders
	UL 62841-2-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-4: Particular Requirements For Hand-Held Sanders And Polishers Other Than Disc Type
	UL 62841-2-5	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-5: Particular Requirements For Hand-Held Circular Saws
	UL 62841-2-8	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-8: Particular Requirements For Hand-Held Shears and Nibblers
	UL 62841-2-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-9: Particular Requirements For Hand-Held Tappers And Threaders
	UL 62841-2-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-10: Particular Requirements For Hand-Held Mixers
	UL 62841-2-11	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-11: Particular Requirements for Hand-Held Reciprocating Saws
	UL 62841-2-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-14: Particular Requirements For Hand-Held Planers
	UL 62841-2-17	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-17:

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Particular Requirements For Hand-Held Routers
	UL 62841-2-21	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-21: Particular Requirements For Hand-Held Drain Cleaners
	UL 62841-3-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1: Particular Requirements For Transportable Table Saws
	UL 62841-3-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-4: Particular Requirements for Transportable Bench Grinders
	UL 62841-3-6	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-6: Particular Requirements For Transportable Diamond Drills with Liquid System
	UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws
	UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular Requirements for Transportable Cut-Off Machines
	UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular Requirements for Transportable Threading Machines
	UL 62841-3-13	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-13: Particular Requirements For Transportable Drills
	UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular Requirements for Transportable Drain Cleaners
	UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers
	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws
	UL 62841-4-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-2: Particular Requirements for Hedge Trimmers
	UL 62841-4-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1000: Particular Requirements For Utility Machines
424	UL 499	Electric Heating Appliances
	UL 1042	Electric Baseboard Heating Equipment
	UL 1673	Electric Space Heating Cables
	UL 1693	Electric Radiant Heating Panels and Heating Panel Sets
	UL 1995	Heating and Cooling Equipment
	UL 1996	Electric Duct Heaters
	UL 2021	Fixed and Location-Dedicated Electric Room Heaters
	UL 2683	Electric Heating Products for Floor and Ceiling Installation
425	UL 508	Industrial Control Equipment
	UL 2021	Fixed and Location-Dedicated Electric Room Heaters
426	IEEE 515	Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications
	UL 1588	Roof and Gutter De-Icing Cable Units
	UL 2049	Residential Pipe Heating Cable
427	IEEE 515	Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications
	UL 515	Electrical Resistance Heat Tracing for Commercial Applications
	UL 2049	Residential Pipe Heating Cable

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
430	UL 4	Armored Cable
	UL 98	Enclosed and Dead-Front Switches
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 347A	Medium Voltage Power Conversion Equipment
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 705	Power Ventilators
	UL 745-1	Portable Electric Tools
	UL 845	Motor Control Centers
	UL 987	Stationary and Fixed Electric Tools
	UL 1004-1	Rotating Electrical Machines — General Requirements
	UL 1004-2	Impedance Protected Motors
	UL 1004-3	Thermally Protected Motors
	UL 1004-6	Servo and Stepper Motors
	UL 1004-7	Electronically Protected Motors
	UL 1004-8	Inverter Duty Motors
	UL 1004-9	Form Wound and Medium Voltage Rotating Electrical Machines
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1569	Metal Clad Cables
	UL 1812	Ducted Heat Recovery Ventilators
	UL 1815	Nonducted Heat Recovery Ventilators
	UL 2565	Industrial Metalworking and Woodworking Machine Tools
	UL 60034-1	Rotating Electrical Machines — Part 1: Rating and Performance
	UL 60335-2-40	Household and Similar Electrical Appliances — Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers
	UL 60730-2-22	Automatic Electrical Controls — Part 2: Particular Requirements for Thermal Motor Protectors
	UL 60745-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements
	UL 60745-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills
	UL 60745-2-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-2: Particular Requirements For Screwdrivers And Impact Wrenches
	UL 60745-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders
	UL 60745-2-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-4: Particular Requirements For Hand-Held Sanders And Polishers Other Than Disc Type
	UL 60745-2-5	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-5: Particular Requirements For Hand-Held Circular Saws
	UL 60745-2-8	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-8: Particular Requirements For Hand-Held Shears and Nibblers
	UL 60947-1	Low-Voltage Switchgear and Controlgear — Part 1: General Rules
	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters
	UL 60947-4-2	Low-Voltage Switchgear and Controlgear — Part 4-2: Contactors and Motor-Starters — AC Semiconductor Motor Controllers and Starters
	UL 60947-5-1	Low-Voltage Switchgear and Controlgear — Part 5-1: Control

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Circuit Devices and Switching Elements — Electromechanical Control Circuit Devices
	UL 60947-5-2	Low-Voltage Switchgear and Controlgear — Part 5-2: Control Circuit Devices and Switching Elements — Proximity Switches
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
	UL 62841-2-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-9: Particular Requirements For Hand-Held Tappers And Threaders
	UL 62841-2-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-10: Particular Requirements For Hand-Held Mixers
	UL 62841-2-11	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-11: Particular Requirements for Hand-Held Reciprocating Saws
	UL 62841-2-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-14: Particular Requirements For Hand-Held Planers
	UL 62841-2-17	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-17: Particular Requirements For Hand-Held Routers
	UL 62841-2-21	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-21: Particular Requirements For Hand-Held Drain Cleaners
	UL 62841-3-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1: Particular Requirements For Transportable Table Saws
	UL 62841-3-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-4: Particular Requirements for Transportable Bench Grinders
	UL 62841-3-6	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-6: Particular Requirements For Transportable Diamond Drills with Liquid System
	UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws
	UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular requirements for Transportable Cut-Off Machines
	UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular requirements for Transportable Threading Machines
	UL 62841-3-13	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-13: Particular Requirements For Transportable Drills
	UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular requirements for Transportable Drain Cleaners
	UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers
	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws
	UL 62841-4-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-2: Particular Requirements for Hedge Trimmers
	UL 62841-4-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1000: Particular Requirements For Utility Machines
440	UL 98	Enclosed and Dead-Front Switches
	UL 416	Refrigerated Medical Equipment

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 484	Room Air Conditioners
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 541	Refrigerated Vending Machines
	UL 563	Ice Makers
	UL 1429	Pullout Switches
	UL 1995	Heating and Cooling Equipment
	UL 60335-2-24	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers
	UL 60335-2-40	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers
	UL 60335-2-89	Household and Similar Electrical Appliances — Safety — Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor
	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters
	UL 60947-4-2	Low-Voltage Switchgear and Controlgear — Part 4-2: Contactors and Motor-Starters — AC Semiconductor Motor Controllers and Starters
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-2: Safety Requirements — Functional
445	UL 508	Industrial Control Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2200	Stationary Engine Generator Assemblies
450	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 305	Panic Hardware
	UL 340	Tests for Comparative Flammability of Liquids
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric Actuators
480	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 305	Panic Hardware
	UL 1642	Lithium Batteries
	UL 1973	Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications
	UL 1989	Standby Batteries
	UL 2054	Household and Commercial Batteries
	UL 4127	Low Voltage Battery Cable
	UL 4128	Intercell and Intertier Connectors for use in Electrochemical Battery System Applications
490	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 347A	Medium Voltage Power Conversion Equipment
	~~UL 347B~~	~~Medium Voltage Motor Controllers, Up to 15kV~~
	UL 347C	Medium Voltage Solid State Resistive Load Controllers, Up to 15kV
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
500	FM 121303	Guide for Use of Detectors for Flammable Gases
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	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 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation.
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection "s"
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
	UL 121303	Guide for Use of Detectors for Flammable Gases
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids
501	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Standard for Electric Heaters For Use in Hazardous (Classified)

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1072	Medium-Voltage Power Cables
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members
	UL 1309A	Cable for Use in Mobile Applications
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection "s"
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids
502	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1309A	Cable for Mobile Installations
	UL 1836	Outline of Investigation for Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Part 30-1: Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection "s"
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
503	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Requirements
	UL 823	Standard for Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
504	UL 698A	Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
	UL 120202	Recommendations for the Preparation, Content, and Organization of Intrinsic Safety Control Drawings
505	FM 121303	Guide for Use of Detectors for Flammable Gases
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	UL 1309A	Cable for Mobile Installations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements
	UL 60079-1	Explosive Atmospheres — Part 1: Equipment Protection by Flameproof Enclosures “d”
	UL 60079-2	Explosive Atmospheres — Part 2: Equipment protection by pressurized enclosure “p”
	UL 60079-5	Explosive Gas Atmospheres — Part 5: Type of Protection — Powder Filling “q”
	UL 60079-6	Explosive Atmospheres — Part 6: Equipment Protection by Liquid Immersion “o”
	UL 60079-7	Explosive Atmospheres — Part 7: Equipment Protection by Increased Safety “e”
	UL 60079-10-1	Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive Gas Atmospheres
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety “i”
	UL 60079-13	Explosive Atmospheres — Part 13: Equipment Protection by Pressurized Room “p” and Artificially Ventilated Room “v”
	UL 60079-15	Explosive Atmospheres — Part 15: Equipment Protection by Type of Protection “n”
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems
	UL 60079-26	Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Explosive Atmospheres — Part 30-1: Electrical Resistance

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection "s"
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety "c", Control of Ignition Source "b", Liquid Immersion "k"
	UL 121303	Guide for Use of Detectors for Flammable Gases
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids
506	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements
	UL 60079-2	Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure "p"
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety "i"
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation "m"
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-30-1	Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-31	Explosive Atmospheres — Part 31: Equipment Dust Ignition Protection by Enclosure "t"
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection "s"
	UL 62784	Vacuum Cleaners and Dust Extractors Providing Equipment Protection Level Dc for the Collection of Combustible Dusts — Particular Requirements
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety "c", Control of Ignition Source "b", Liquid Immersion "k"
512	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations
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
517	AAMI ES 60601-1	Medical electrical equipment — Part 1: General requirements for basic safety and essential performance
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 467	Grounding and Bonding Equipment
	UL 498	Attachment Plugs and Receptacles

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 1022	Line Isolation Monitors
	UL 1047	Isolated Power Systems Equipment
	UL 1286	Office Furnishing Systems
	UL 2930	Cord-and-Plug-connected Health Care Facility Outlet Assemblies
	UL 60601-1	Medical Electrical Equipment — Part 1: General Requirements for Safety
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids
518	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 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 2305	Exhibition Display Units, Fabrication and Installation
	UL 2305A	Convention Center Cord Sets
520	UL 62	Flexible Cords and Cables
	UL 334	Theater Lighting Distribution and Control Equipment
	UL 1573	Stage and Studio Luminaires and Connector Strips
	UL 1640	Portable Power-Distribution Equipment
	UL 1691	Single Pole Locking-Type Separable Connectors
	UL 489	**Attachment Plugs and Receptacles**
522	UL 13	Power Limited Circuit Cables
	UL 1063	Machine-Tool Wires and Cables
	UL 2250	Instrumentation Tray Cable
525	UL 62	Flexible Cords and Cables
	UL 817	Cord Sets and Power-Supply Cords
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1691	Single Pole Locking-Type Separable Connectors
530	UL 62	Flexible Cords and Cables
	UL 1479	Fire Tests of Penetration Firestops
	UL 1573	Stage and Studio Luminaires and Connector Strips
	UL 1680	Stage and Lighting Cables
	UL 1691	Single Pole Locking-Type Separable Connectors
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
	UL 67	**Panelboards**
	UL 943	**Ground-Fault Circuit Interrupters**
	UL 1640	**Portable Power-Distribution Equipment**

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
540	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
545	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 5B	Strut-Type Channel Raceways and Fittings
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
	UL 20	General Use Snap Switches
	UL 209	Cellular Metal Floor Raceways and Fittings
	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 514A	Metallic Outlet Boxes
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 2024	Cable Routing Assemblies and Communications Raceways
547	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 62	Flexible Cords and Cables
	UL 514A	Metallic Outlet Boxes
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 1598	Luminaires
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
550	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 307A	Liquid Fuel-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles
	UL 307B	Gas-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	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 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1462	Mobile Home Pipe Heating Cable
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2108	Low-Voltage Lighting Systems
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
551	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		Stainless Steel
	UL 62	Flexible Cords and Cables
	UL 231	Power Outlets
	UL 234	Low Voltage Lighting Fixtures for use in Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 467	Grounding and Bonding Equipment
	UL 486C	Splicing Wire Connectors
	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 514A	Metallic Outlet Boxes
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1008	Transfer Switch Equipment
	UL 1008M	Transfer Switch Equipment, Meter Mounted
	UL 1008S	Solid-State Transfer Switches
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1449	Surge Protective Devices
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2200	Stationary Engine Generator Assemblies
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 60730-1	Automatic Electrical Controls; Part 1: General Requirements
	UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls
552	SAE J1128-2015	Low Voltage Primary Cable, for Types GXL, HDT, and SXL
	SAE J1127-2015	Low Voltage Battery Cable, for Types SGT and SGR
	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 62	Flexible Cords and Cables
	UL 67	Panelboards
	UL 231	Power Outlets
	UL 234	Low Voltage Lighting Fixtures for Use in Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 430	Waste Disposers
	UL 467	Grounding and Bonding Equipment
	UL 514A	Metallic Outlet Boxes
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 916	Energy Management Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment
	UL 1598	Luminaires

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2108	Low Voltage Lighting Systems
	UL 2200	Stationary Engine Generator Assemblies
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
555	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 231	Power Outlets
	UL 486D	Sealed Wire Connector Systems
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 676	Underwater Luminaires and Submersible Junction Boxes
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
	UL 1650	Portable Power Cable
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 1399	Leakage Current Measurement Devices for Use in Marina Applications
590	UL 496	Lampholders
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 588	Seasonal and Holiday Decorative Products
	UL 817	Cord Sets
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1088	Temporary Lighting Strings
	UL 1377	Wire used in Low Voltage Seasonal Lighting Products In Circuits With a Maximum Available Power of 15W
	UL 1640	Portable Power-Distribution Equipment
600	UL 1	Flexible Metal Conduit
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 13	Power-Limited Circuit Cables
	UL 48	Electric Signs
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems
	UL 814	Gas-Tube-Sign Cable
	UL 879	Electric Sign Components
	UL 879A	LED Sign and Sign Retrofit Kits
	UL 879B	Polymeric Enclosure Systems for the Splice Between Neon Tubing Electrode Leads and GTO Cable, and the GTO Cable Leading to the Splice
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1310	Class 2 Power Units
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2161	Neon Transformers and Power Supplies
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
	UL 3001	Distributed Energy Generation and Storage Systems

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 3003	Distributed Generation Cables
	UL 3703	Solar Trackers
	UL 4703	Photovoltaic Wire
	UL 6703	Connectors for Use in Photovoltaic Systems
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings
	UL 8703	Concentrator Photovoltaic Modules and Assemblies
	UL 9703	Distributed Generation Wiring Harnesses
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements For Construction
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements For Testing
	UL 62109	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
604	UL 1	Flexible Metal Conduit
	UL 4	Armored Cable
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 5B	Strut-Type Channel Raceways and Fittings
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
	UL 62	Flexible Cords and Cables
	UL 183	Manufactured Wiring Systems
	UL 209	Cellular Metal Floor Raceways and Fittings
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 797	Electrical Metallic Tubing — Steel
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel
	UL 857	Busways
	UL 1569	Metal-Clad Cables
	UL 2024	Cable Routing Assemblies and Communications Raceways
605	UL 962	Household and Commercial Furnishings
	UL 1286	Office Furnishings Systems
	UL 1310	Class 2 Power Units
	UL 2999	Individual Commercial Office Furnishings
	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
610	UL 62	Flexible Cords and Cables
	UL 2273	Festoon Cable
620	UL 62	Flexible Cords and Cables
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 98	Enclosed and Dead-Front Switches
	UL 104	Elevator Door Locking Devices and Contacts
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 508A	Industrial Control Panels
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1310	Class 2 Power Units
	UL 1449	Surge Protective Devices
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 2556	Wire and Cable Test Methods
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
625	UL 62	Flexible Cords And Cables
	UL 1650	Portable Power Cable
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2202	~~Electric Vehicle (EV)~~ DC Charging ~~System~~ Equipment for Electric Vehicles
	UL 2231-1	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 1: General Requirements
	UL 2231-2	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 2: Particular Requirements for Protection Devices for Use in Charging Systems
	UL 2251	Plugs, Receptacles and Couplers for Electrical Vehicles
	UL 2580	Batteries for Use in Electric Vehicles
	UL 2594	Electric Vehicle Supply Equipment
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)
	UL 60730-1	Automatic Electrical Controls
626	UL 62	Flexible Cords and Cables
	UL 231	Power Outlets
	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 817	Cord Sets and Power-Supply Cords
	UL 1651	Optical Fiber Cable
	UL 1686	Pin and Sleeve Configurations
630	UL 551	Transformer-Type Arc-Welding Machines
640	UL 13	Power Limited Circuit Cables
	UL 62	Flexible Cords and Cables
	UL 813	Commercial Audio Equipment
	UL 1310	Class 2 Power Units
	UL 1419	Professional Video and Audio Equipment
	UL 1492	Audio-Video Products and Accessories
	UL 1711	Amplifiers for Fire Protective Signaling Systems
	UL 2269	Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes
	UL 6500	Audio/Video and Musical Instrument Apparatus for Household, Commercial, and Similar General Use
	UL 60065	Audio, Video and Similar Electronic Apparatus — Safety Requirements
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
645	UL 38	Manual Signaling Boxes for Fire Alarm Systems
	UL 268	Smoke Detectors for Fire Alarm Systems
	UL 444	Communications Cables
	UL 464	Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
	UL 497B	Protectors for Data Communications and Fire Alarm Circuits
	UL 833	Control Units and Accessories for Fire Alarm Systems
	UL 864	Control Units and Accessories for Fire Alarm Systems
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits
	UL 1425	Cables for Non-Power-Limited Fire-Alarm Circuits

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 1449	Surge Protective Devices
	UL 1480	Speakers for Fire Alarm and Signaling Systems, Including Accessories
	UL 1638	Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
	UL 1651	Optical Fiber Cable
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 1690	Data-Processing Cable
	UL 1778	Uninterruptible Power Systems
	UL 2024	Cable Routing Assemblies and Communications Raceways
	UL 60950-1	Information Technology Equipment Safety — Part 1: General Requirements
	UL 60950-21	Information Technology Equipment Safety — Part 21: Remote Power Feeding
	UL 60950-22	Information Technology Equipment Safety — Part 22: Equipment to be Installed Outdoors
	UL 60950-23	Information Technology Equipment Safety — Part 23: Large Data Storage Equipment
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
646	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 62	Flexible Cords and Cables
	UL 67	Panelboards
	UL 98	Enclosed and Dead-Front Switches
	UL 305	Panic Hardware
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 508A	Industrial Control Panels
	UL 845	Motor Control Centers
	UL 869A	Reference Standard for Service Equipment
	UL 891	Switchboards
	UL 924	Emergency Lighting and Power Equipment
	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 1062	Unit Substations
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1429	Pullout Switches
	UL 1449	Surge Protective Devices
	UL 1655	Community-Antenna Television Cables
	UL 1989	Standby Batteries
	UL 2755	Modular Data Centers
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
647	UL 1598	Luminaires
650	UL 1310	Class 2 Power Units
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
670	ANSI/CSA-C22.2 No. 19085-1	Woodworking machines — Safety — Part 1: Common requirements

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 508	Industrial Control Equipment
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
675	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
680	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 20	General Use Snap-Switches
	UL 62	Flexible Cords and Cables
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 379	Power Units for Fountain, Swimming Pool, and Spa Luminaires
	UL 467	Grounding and Bonding Equipment
	UL 486D	Sealed Wire Connector Systems
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 676	Underwater Luminaires and Submersible Junction Boxes
	UL 676A	Potting Compounds for Swimming Pool, Fountain, and Spa Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1004-10	Pool Pump Motors
	UL 1081	Swimming Pool Pumps, Filters, and Chlorinators
	UL 1241	Junction Boxes for Swimming Pool Luminaires
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1261	Electric Water Heaters for Pools and Tubs
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment
	UL 1569	Metal-Clad Cables
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 1795	Hydromassage Bathtubs
	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 2452	Electric Swimming Pool and Spa Cover Operators
	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
	UL 2995	Lifts for Swimming Pools and Spas
	UL 60335-2-1000	Household and Similar Electrical Appliances: Particular Requirements for Electrically Powered Pool Lifts
682	UL 486D	Sealed Wire Connector Systems
	UL 1650	Portable Power Cable
	UL 1838	Low Voltage Landscape Lighting Systems
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
690	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses
	UL 467	Grounding and Bonding Equipment
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 1569	Metal-Clad Cables
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection
	UL 1703	Flat-Plate Photovoltaic Modules and Panels
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
	UL 3001	Distributed Energy Generation and Storage Systems
	UL 3003	Distributed Generation Cables
	UL 3005	Distributed Energy Resource Management Systems
	UL 3703	Solar Trackers
	UL 3730	Photovoltaic Junction Boxes
	UL 3741	Photovoltaic Hazard Control
	UL 4703	Photovoltaic Wire
	UL 6703	Connectors for Use in Photovoltaic Systems
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings
	UL 8703	Concentrator Photovoltaic Modules and Assemblies
	UL 8801	Photovoltaic Luminaire Systems
	UL 9703	Distributed Generation Wiring Harnesses
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements for Construction
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements for Testing
	UL 62109-1	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
	UL 62109-2	Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
692	UL 2262	Fuel Cell Modules for Use in Portable and Stationary Equipment
	UL 2262A	Borohydride Fuel Cartridges with Integral Fuel Processing for Use with Portable Fuel Cell Power Systems or Similar Equipment
	UL 2265	Fuel Cell Power Units and Fuel Storage Containers for Portable Devices
	UL 2265A	Hand-held or Hand-Transportable Fuel Cell Power Units with Disposable Methanol Fuel Cartridges for use in Original Equipment Manufacturer's Information Technology Equipment
	UL 2265C	Hand-Held or Hand-Transportable Alkaline (Direct Borohydride) Fuel Cell Power Units and Borohydride Fuel Cartridges For Use With Consumer Electronics or Information Technology Equipment
	UL 2266	Electromagnetic Compatibility, Electrical Safety, and Physical Protection of Stationary and Portable Fuel Cell Power Systems for Use with Commercial Network Telecommunications Equipment
	UL 2267	Fuel Cell Power Systems for Installation in Industrial Electric Trucks
694	UL 467	Grounding and Bonding Equipment
	UL 489C	Molded-Case Circuit Breakers and Molded-Case Switches for Use with Wind Turbines
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2227	Flexible Motor Supply Cable and Wind Turbine Tray Cable
	UL 2736	Single Pole Separable Interconnecting Cable Connectors for Use with Wind Turbine Generating Systems
	UL 4143	Wind Turbine Generator — Life Time Extension (LTE)

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 6141	Wind Turbines Permitting Entry of Personnel
	UL 6142	Wind Turbine Generating Systems — Small
695	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 218	Fire Pump Controllers
	UL 448	Centrifugal Stationary Pumps for Fire-Protection Service
	UL 448B	Residential Fire Pumps Intended for One- and Two-Family Dwellings and Manufactured Homes
	UL 448C	Stationary, Rotary-Type, Positive-Displacement Pumps for Fire Protection Service
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 1004-5	Fire Pump Motors
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1569	Metal-Clad Cables
	UL 1724	Fire Tests for Electrical Circuit Protective Systems
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
700	UL 924	Emergency Lighting and Power Equipment
	UL 1008	Transfer Switch Equipment
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
	UL 1449	Surge Protective Devices
	UL 1724	Fire Tests for Electrical Circuit Protective Systems
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 2200	Stationary Engine Generator Assemblies
701	UL 924	Emergency Lighting and Power Equipment
	UL 1008	Transfer Switch Equipment
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
702	UL 98	Enclosed and Dead-Front Switches
	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
705	UL 62	Flexible Cords and Cables
	UL 98	Enclosed and Dead-Front Switches
	UL 486D	Sealed Wire Connector Systems
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1429	Pullout Switches
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2200	Stationary Engine Generator Assemblies
	UL 3001	Distributed Energy Resource Systems
	UL 3003	Distributed Generation Cables
	UL 3010	Single Site Energy Systems
	UL 6141	Wind Turbines Permitting Entry of Personnel
	UL 6142	Small Wind Turbine Systems
	UL 9540	Energy Storage Systems and Equipment
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)
	UL 62109-2	Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 62109-1	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
706	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 248-6	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
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses
	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
	UL 489H	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures, for Use with Direct Current (DC) Microgrids
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 9540	Energy Storage Systems and Equipment
708	UL 1	Flexible Metal Conduit
	UL 4	Armored Cable
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 497A	Secondary Protectors for Communications Circuits
	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 1569	Metal-Clad Cables
	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
	UL 2200	Stationary Engine Generator Assemblies
	UL 8801	Photovoltaic Luminaire Systems
	UL 9540	Energy Storage Systems and Equipment
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)
	UL 62109-1	Power Converters for use in Photovoltaic Power Systems — Part 1: General Requirements
	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
	UL 444	Standard for Safety for Communications Cables
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits
	UL 1651	Optical Fiber Cable
	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

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	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
	UL 9990	Information and Communication Technology (ICT) Power Cables
	UL 61010-2-201	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-201: Particular Requirements for Control Equipment
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
	UL 60730-1	Automatic Electrical Controls
726	UL 1400-1	Fault-Managed Power Systems — Part 1 General Requirements
	UL 1400-2	Fault-Managed Power Systems — Part 2 Requirements for Cables
	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
	UL 2556	Wire and Cable Test Methods
728	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	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
750	**UL 60730-1**	**Automatic Electrical Controls**
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
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	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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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 568	Nonmetallic Cable Tray Systems
	UL 1651	Optical Fiber Cable
	UL 2024	Optical Fiber and Communication Cable Raceway
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
800	UL 444	Communications Cables
	UL 467	Grounding and Bonding Equipment
	UL 489A	Circuit Breakers for Use in Communication Equipment
	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
	UL 568	Nonmetallic Cable Tray Systems
	UL 723	Test for Surface Burning Characteristics of Building Materials
	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
	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
	UL1724	Outline for Fire Tests for Electrical Circuit Protective Systems
	UL2556	**Wire and Cable Test Methods**
	UL2043	Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
	UL2196	Tests for Fire Resistive Cables
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
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
	~~UL 719~~	~~Nonmetallic-Sheathed Cables~~
	~~UL 1310~~	~~Class 2 Power Units~~
	~~UL 1581~~	~~Reference Standard for Electrical Wires, Cables, and Flexible Cords~~
	~~UL 1685~~	~~Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables~~
	~~UL 1863~~	~~Communication Circuit Accessories~~
	~~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~~
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
810	UL 150	Antenna Rotators
	UL 452	Antenna-Discharge Units
	UL 467	Grounding and Bonding Equipment
	UL 497E	Protectors for Antenna Lead-In Conductors

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Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
820	UL 444	Communications Cables
	UL 497E	Protectors for Antenna Lead-In Conductors
	UL 1655	Community-Antenna Television Cables
830	UL 444	Communications Cables
	UL 497A	Secondary Protectors for Communications Circuits
	UL 497C	Protectors for Coaxial Communications Circuits
	UL 497E	Protectors for Antenna Lead-In Conductors
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
840	UL 444	Communications Cables
	UL 467	Grounding and Bonding Equipment
	UL 498A	Current Taps and Adapters
	UL 1310	Class 2 Power Units
	UL 1651	Optical Fiber Cable
	UL 1863	Communication Circuit Accessories
	UL 2024	Cable Routing Assemblies and Communications Raceways
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
Tables 11(A) and 11(B)	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
Tables 12(A) and 12(B)	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

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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
210	UL 1053	Ground-Fault Sensing and Relaying Equipment
215	UL 1053	Ground-Fault Sensing and Relaying Equipment
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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	UL 1693	Electric Radiant Heating Panels and Heating Panel Sets
	UL 1995	Heating and Cooling Equipment
	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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		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,

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
		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
	NFPA 88A	Standard for Parking Structures
512	ICC IFC	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
	NFPA 409	Standard on Aircraft Hangars
514	NFPA 2	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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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
	UL 1740	**Standard for Robots and Robotic Equipment**
	UL 3100	**Standard for Automated Mobile Platforms (AMPs)**
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

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Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
	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
	UL 3008	**Automatic Interconnection Switches for Emergency Systems**
701	UL 3001	Distributed Energy Generation and Storage Systems
	UL 3008	**Automatic Interconnection Switches for Emergency 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

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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

Article	Standard Number	Standard Title
	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
	UL 248-4	Low-Voltage Fuses — Part 4: Class CC Fuses
	UL 248-5	Low-Voltage Fuses — Part 5: Class G Fuses
	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
	UL 248-11	Low-Voltage Fuses — Part 11: Plug Fuses
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses
	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
	UL 489I	Solid State Molded-Case Circuit Breakers
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 4248-1	Fuseholders — Part 1: General Requirements
242	UL 1449	Surge Protective Devices
250	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

Article	Standard Number	Standard Title
	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 93ºC and Copper-to-Copper Conductors Designed for Normal Operation at or Below 100ºC
	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

Article	Standard Number	Standard Title
	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
	UL 1953	Power Distribution Blocks
320	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

Article	Standard Number	Standard Title
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-Interrupters
	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-Interrupters
	UL 1998	Software in Programmable Components
384	UL 5B	Strut-Type Channel Raceways and Fittings
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Article	Standard Number	Standard Title
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
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	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 60730-2-7	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

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	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-Interrupters
	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

Article	Standard Number	Standard Title
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
	UL 122	Photographic Equipment
	UL 141	Garment Finishing Appliances
	UL 174	Household Electric Storage Tank Water Heaters
	UL 197	Commercial Electric Cooking Appliances
	UL 283	Air Fresheners and Deodorizers
	UL 399	Drinking Water Coolers
	UL 430	Waste Disposers
	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 499	Electric Heating Appliances
	UL 507	Electric Fans
	UL 514A	Metallic Outlet Boxes
	UL 515	Electric Resistance Trace Heating for Commercial Applications
	UL 561	Floor Finishing Machines
	UL 574	Electric Oil Heaters
	UL 621	Ice Cream Makers
	UL 705	Power Ventilators
	UL 710B	Recirculating Systems
	UL 749	Household Dishwashers
	UL 751	Vending Machines
	UL 763	Motor-Operated Commercial Food Preparing Machines
	UL 778	Motor-Operated Water Pumps
	UL 834	Heating, Water Supply, and Power Boilers — Electric
	UL 858	Household Electric Ranges
	UL 875	Electric Dry-Bath Heaters
	UL 921	Commercial Dishwashers
	UL 923	Microwave Cooking Appliances
	UL 943	Ground-Fault Circuit-Interrupters
	UL 962	Household and Commercial Furnishings
	UL 962A	Furniture Power Distribution Units
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	UL 982	Motor-Operated Household Food Preparing Machines
	UL 987	Stationary and Fixed Electric Tools
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	UL 1026	Household Electric Cooking and Food Serving Appliances
	UL 1086	Household Trash Compactors
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	UL 1278	Movable and Wall- or Ceiling-Hung Electric Room Heaters
	UL 1447	Electric Lawn Mowers
	UL 1450	Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment
	UL 1453	Electric Booster and Commercial Storage Tank Water Heaters
	UL 1576	Flashlights and Lanterns
	UL 1594	Sewing and Cutting Machines
	UL 1647	Motor-Operated Massage and Exercise Machines
	UL 1727	Commercial Electric Personal Grooming Appliances
	UL 1776	High-Pressure Cleaning Machines
	UL 2157	Electric Clothes Washing Machines and Extractors
	UL 2158	Electric Clothes Dryers
	UL 2565	Industrial Metalworking and Woodworking Machine Tools
	UL 60335-2-3	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electric Irons
	UL 60335-2-8	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Shavers, Hair Clippers, and Similar Appliances
	UL 60335-2-24	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances, and Ice-Makers
	UL 60335-2-40	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers
	UL 60335-2-67	Household and Similar Electrical Appliances — Safety — Part 2-67: Particular Requirements for Floor Treatment Machines, For Commercial Use
	UL 60335-2-68	Household and Similar Electrical Appliances — Safety — Part 2-68: Particular Requirements for Spray Extraction Machines, for Commercial Use
	UL 60335-2-79	Household and Similar Electrical Appliances — Safety — Part 2-79: Particular Requirements for High Pressure Cleaners and Steam Cleaners
	UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls
	UL 60745-1	Hand-Held Motor-Operated Electric Tools — Safety — Part 1: General Requirements
	UL 60745-2-1	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-1: Particular Requirements for Drills and Impact Drills
	UL 60745-2-2	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-2: Particular Requirements for Screwdrivers and Impact Wrenches
	UL 60745-2-3	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-3: Particular Requirements for Grinders, Polishers, and Disk-Type Sanders
	UL 60745-2-4	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type
	UL 60745-2-5	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-5: Particular Requirements for Circular Saws
	UL 60745-2-6	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-6: Particular Requirements for Hammers
	UL 60745-2-8	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-8: Particular Requirements for Shears and Nibblers
	UL 60745-2-9	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-9: Particular Requirements for Tappers
	UL 60745-2-11	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-11: Particular Requirements for Reciprocating Saws
	UL 60745-2-12	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-12: Particular Requirements For Concrete Vibrators
	UL 60745-2-13	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-13: Particular Requirements For Chain Saws
	UL 60745-2-14	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-14: Particular Requirements for Planers

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	UL 60745-2-16	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-16: Particular Requirements for Tackers
	UL 60745-2-17	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-17: Particular Requirements for Routers and Trimmers
	UL 60745-2-18	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-18: Particular Requirements For Strapping Tools
	UL 60745-2-19	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-19: Particular Requirements for Jointers
	UL 60745-2-20	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-20: Particular Requirements for Band Saws
	UL 60745-2-21	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-21: Particular Requirements For Drain Cleaners
	UL 60745-2-22	Hand-Held Motor-Operated electric Tools — Safety — Part 2-22: Particular Requirements for Cut-Off Machines
	UL 60745-2-23	Hand-Held Motor-Operated electric Tools — Safety — Part 2-23: Particular Requirements for Die Grinders and Small Rotary Tools
	UL 62841-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements
	UL 62841-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills
	UL 62841-2-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-2: Particular Requirements For Screwdrivers And Impact Wrenches
	UL 62841-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders
	UL 62841-2-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-4: Particular Requirements For Hand-Held Sanders And Polishers Other Than Disc Type
	UL 62841-2-5	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-5: Particular Requirements For Hand-Held Circular Saws
	UL 62841-2-8	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-8: Particular Requirements For Hand-Held Shears and Nibblers
	UL 62841-2-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-9: Particular Requirements For Hand-Held Tappers And Threaders
	UL 62841-2-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-10: Particular Requirements For Hand-Held Mixers
	UL 62841-2-11	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-11: Particular Requirements for Hand-Held Reciprocating Saws
	UL 62841-2-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-14: Particular Requirements For Hand-Held Planers
	UL 62841-2-17	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-17: Particular Requirements For Hand-Held Routers
	UL 62841-2-21	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-21: Particular Requirements For Hand-Held Drain Cleaners
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	UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws
	UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular Requirements for Transportable Cut-Off Machines
	UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular Requirements for Transportable Threading Machines
	UL 62841-3-13	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-13: Particular Requirements For Transportable Drills
	UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular Requirements for Transportable Drain Cleaners
	UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers
	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws
	UL 62841-4-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-2: Particular Requirements for Hedge Trimmers
	UL 62841-4-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1000: Particular Requirements For Utility Machines
424	UL 499	Electric Heating Appliances
	UL 1042	Electric Baseboard Heating Equipment
	UL 1673	Electric Space Heating Cables
	UL 1693	Electric Radiant Heating Panels and Heating Panel Sets
	UL 1995	Heating and Cooling Equipment
	UL 1996	Electric Duct Heaters
	UL 2021	Fixed and Location-Dedicated Electric Room Heaters
	UL 2683	Electric Heating Products for Floor and Ceiling Installation
425	UL 508	Industrial Control Equipment
	UL 2021	Fixed and Location-Dedicated Electric Room Heaters
426	IEEE 515	Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications
	UL 1588	Roof and Gutter De-Icing Cable Units
	UL 2049	Residential Pipe Heating Cable
427	IEEE 515	Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications
	UL 515	Electrical Resistance Heat Tracing for Commercial Applications
	UL 2049	Residential Pipe Heating Cable
430	UL 4	Armored Cable
	UL 98	Enclosed and Dead-Front Switches
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 347A	Medium Voltage Power Conversion Equipment
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 705	Power Ventilators
	UL 745-1	Portable Electric Tools

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	UL 987	Stationary and Fixed Electric Tools
	UL 1004-1	Rotating Electrical Machines — General Requirements
	UL 1004-2	Impedance Protected Motors
	UL 1004-3	Thermally Protected Motors
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	UL 1004-7	Electronically Protected Motors
	UL 1004-8	Inverter Duty Motors
	UL 1004-9	Form Wound and Medium Voltage Rotating Electrical Machines
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1569	Metal Clad Cables
	UL 1812	Ducted Heat Recovery Ventilators
	UL 1815	Nonducted Heat Recovery Ventilators
	UL 2565	Industrial Metalworking and Woodworking Machine Tools
	UL 60034-1	Rotating Electrical Machines — Part 1: Rating and Performance
	UL 60335-2-40	Household and Similar Electrical Appliances — Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers
	UL 60730-2-22	Automatic Electrical Controls — Part 2: Particular Requirements for Thermal Motor Protectors
	UL 60745-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements
	UL 60745-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills
	UL 60745-2-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-2: Particular Requirements For Screwdrivers And Impact Wrenches
	UL 60745-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders
	UL 60745-2-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-4: Particular Requirements For Hand-Held Sanders And Polishers Other Than Disc Type
	UL 60745-2-5	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-5: Particular Requirements For Hand-Held Circular Saws
	UL 60745-2-8	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-8: Particular Requirements For Hand-Held Shears and Nibblers
	UL 60947-1	Low-Voltage Switchgear and Controlgear — Part 1: General Rules
	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters
	UL 60947-4-2	Low-Voltage Switchgear and Controlgear — Part 4-2: Contactors and Motor-Starters — AC Semiconductor Motor Controllers and Starters
	UL 60947-5-1	Low-Voltage Switchgear and Controlgear — Part 5-1: Control Circuit Devices and Switching Elements — Electromechanical Control Circuit Devices
	UL 60947-5-2	Low-Voltage Switchgear and Controlgear — Part 5-2: Control Circuit Devices and Switching Elements — Proximity Switches
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
	UL 62841-2-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-9: Particular Requirements For Hand-Held Tappers And Threaders
	UL 62841-2-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-10: Particular Requirements For Hand-Held Mixers

Article	Standard Number	Standard Title
	UL 62841-2-11	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-11: Particular Requirements for Hand-Held Reciprocating Saws
	UL 62841-2-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-14: Particular Requirements For Hand-Held Planers
	UL 62841-2-17	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-17: Particular Requirements For Hand-Held Routers
	UL 62841-2-21	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-21: Particular Requirements For Hand-Held Drain Cleaners
	UL 62841-3-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1: Particular Requirements For Transportable Table Saws
	UL 62841-3-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-4: Particular Requirements for Transportable Bench Grinders
	UL 62841-3-6	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-6: Particular Requirements For Transportable Diamond Drills with Liquid System
	UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws
	UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular requirements for Transportable Cut-Off Machines
	UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular requirements for Transportable Threading Machines
	UL 62841-3-13	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-13: Particular Requirements For Transportable Drills
	UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular requirements for Transportable Drain Cleaners
	UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers
	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws
	UL 62841-4-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-2: Particular Requirements for Hedge Trimmers
	UL 62841-4-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1000: Particular Requirements For Utility Machines
440	UL 98	Enclosed and Dead-Front Switches
	UL 416	Refrigerated Medical Equipment
	UL 484	Room Air Conditioners
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 541	Refrigerated Vending Machines
	UL 563	Ice Makers
	UL 1429	Pullout Switches
	UL 1995	Heating and Cooling Equipment
	UL 60335-2-24	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers

Article	Standard Number	Standard Title
	UL 60335-2-40	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers
	UL 60335-2-89	Household and Similar Electrical Appliances — Safety — Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor
	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters
	UL 60947-4-2	Low-Voltage Switchgear and Controlgear — Part 4-2: Contactors and Motor-Starters — AC Semiconductor Motor Controllers and Starters
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-2: Safety Requirements — Functional
445	UL 508	Industrial Control Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 2200	Stationary Engine Generator Assemblies
450	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 305	Panic Hardware
	UL 340	Tests for Comparative Flammability of Liquids
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric Actuators
480	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 305	Panic Hardware
	UL 1642	Lithium Batteries
	UL 1973	Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications
	UL 1989	Standby Batteries
	UL 2054	Household and Commercial Batteries
	UL 4127	Low Voltage Battery Cable
	UL 4128	Intercell and Intertier Connectors for use in Electrochemical Battery System Applications
490	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 347A	Medium Voltage Power Conversion Equipment
	UL 347B	Medium Voltage Motor Controllers, Up to 15kV
	UL 347C	Medium Voltage Solid State Resistive Load Controllers, Up to 15kV
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
500	FM 121303	Guide for Use of Detectors for Flammable Gases
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	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 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations

Article	Standard Number	Standard Title
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation.
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
	UL 121303	Guide for Use of Detectors for Flammable Gases
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids
501	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Standard for Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1072	Medium-Voltage Power Cables
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members
	UL 1309A	Cable for Use in Mobile Applications
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2,

Article	Standard Number	Standard Title
		Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Potentially Flammable or Combustible Process Fluids
502	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
	UL 1309A	Cable for Mobile Installations
	UL 1836	Outline of Investigation for Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-28	Part 30-1: Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
503	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	UL 823	Standard for Electric Heaters For Use in Hazardous (Classified) Locations
	UL 844	Luminaires for Use in Hazardous (Classified) Locations
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations

Article	Standard Number	Standard Title
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
504	UL 698A	Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
	UL 120202	Recommendations for the Preparation, Content, and Organization of Intrinsic Safety Control Drawings
505	FM 121303	Guide for Use of Detectors for Flammable Gases
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations
	UL 1309A	Cable for Mobile Installations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements
	UL 60079-1	Explosive Atmospheres — Part 1: Equipment Protection by Flameproof Enclosures “d”
	UL 60079-2	Explosive Atmospheres — Part 2: Equipment protection by pressurized enclosure “p”
	UL 60079-5	Explosive Gas Atmospheres — Part 5: Type of Protection — Powder Filling “q”
	UL 60079-6	Explosive Atmospheres — Part 6: Equipment Protection by Liquid Immersion “o”
	UL 60079-7	Explosive Atmospheres — Part 7: Equipment Protection by Increased Safety “e”
	UL 60079-10-1	Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive Gas Atmospheres
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety “i”
	UL 60079-13	Explosive Atmospheres — Part 13: Equipment Protection by Pressurized Room “p” and Artificially Ventilated Room “v”
	UL 60079-15	Explosive Atmospheres — Part 15: Equipment Protection by Type of Protection “n”
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems
	UL 60079-26	Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases
	UL 60079-30-1	Explosive Atmospheres — Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”

Article	Standard Number	Standard Title
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety “c”, Control of Ignition Source “b”, Liquid Immersion “k”
	UL 121303	Guide for Use of Detectors for Flammable Gases
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids
506	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements
	UL 60079-2	Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure “p”
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety "i"
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation
	UL 60079-30-1	Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements
	UL 60079-31	Explosive Atmospheres — Part 31: Equipment Dust Ignition Protection by Enclosure “t”
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection “s”
	UL 62784	Vacuum Cleaners and Dust Extractors Providing Equipment Protection Level Dc for the Collection of Combustible Dusts — Particular Requirements
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety “c”, Control of Ignition Source “b“, Liquid Immersion “k”
512	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations
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
517	AAMI ES 60601-1	Medical electrical equipment — Part 1: General requirements for basic safety and essential performance
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	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

Article	Standard Number	Standard Title
	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 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 1022	Line Isolation Monitors
	UL 1047	Isolated Power Systems Equipment
	UL 1286	Office Furnishing Systems
	UL 2930	Cord-and-Plug-connected Health Care Facility Outlet Assemblies
	UL 60601-1	Medical Electrical Equipment — Part 1: General Requirements for Safety
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids
518	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 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 2305	Exhibition Display Units, Fabrication and Installation
	UL 2305A	Convention Center Cord Sets
520	UL 62	Flexible Cords and Cables
	UL 334	Theater Lighting Distribution and Control Equipment
	UL 1573	Stage and Studio Luminaires and Connector Strips
	UL 1640	Portable Power-Distribution Equipment
	UL 1691	Single Pole Locking-Type Separable Connectors
522	UL 13	Power Limited Circuit Cables
	UL 1063	Machine-Tool Wires and Cables
	UL 2250	Instrumentation Tray Cable
525	UL 62	Flexible Cords and Cables
	UL 817	Cord Sets and Power-Supply Cords
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1691	Single Pole Locking-Type Separable Connectors
530	UL 62	Flexible Cords and Cables
	UL 1479	Fire Tests of Penetration Firestops
	UL 1573	Stage and Studio Luminaires and Connector Strips
	UL 1680	Stage and Lighting Cables
	UL 1691	Single Pole Locking-Type Separable Connectors
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
540	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
545	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 5B	Strut-Type Channel Raceways and Fittings
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
	UL 20	General Use Snap Switches
	UL 209	Cellular Metal Floor Raceways and Fittings
	UL 498	Attachment Plugs and Receptacles
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts

Article	Standard Number	Standard Title
	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 514A	Metallic Outlet Boxes
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 2024	Cable Routing Assemblies and Communications Raceways
547	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 62	Flexible Cords and Cables
	UL 514A	Metallic Outlet Boxes
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 1598	Luminaires
	UL 2225	Cable and Cable Fittings for Use in Hazardous (Classified) Locations
550	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 307A	Liquid Fuel-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles
	UL 307B	Gas-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	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 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1462	Mobile Home Pipe Heating Cable
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2108	Low-Voltage Lighting Systems
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
551	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 62	Flexible Cords and Cables
	UL 231	Power Outlets
	UL 234	Low Voltage Lighting Fixtures for use in Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 467	Grounding and Bonding Equipment
	UL 486C	Splicing Wire Connectors
	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 514A	Metallic Outlet Boxes

Article	Standard Number	Standard Title
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1008	Transfer Switch Equipment
	UL 1008M	Transfer Switch Equipment, Meter Mounted
	UL 1008S	Solid-State Transfer Switches
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1449	Surge Protective Devices
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2200	Stationary Engine Generator Assemblies
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 60730-1	Automatic Electrical Controls; Part 1: General Requirements
	UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls
552	SAE J1128-2015	Low Voltage Primary Cable, for Types GXL, HDT, and SXL
	SAE J1127-2015	Low Voltage Battery Cable, for Types SGT and SGR
	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 62	Flexible Cords and Cables
	UL 67	Panelboards
	UL 231	Power Outlets
	UL 234	Low Voltage Lighting Fixtures for Use in Recreational Vehicles
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 430	Waste Disposers
	UL 467	Grounding and Bonding Equipment
	UL 514A	Metallic Outlet Boxes
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 817	Cord Sets and Power-Supply Cords
	UL 916	Energy Management Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1004-4	Electric Generators
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment
	UL 1598	Luminaires
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 2108	Low Voltage Lighting Systems
	UL 2200	Stationary Engine Generator Assemblies
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
555	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 231	Power Outlets
	UL 486D	Sealed Wire Connector Systems
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 676	Underwater Luminaires and Submersible Junction Boxes

Article	Standard Number	Standard Title
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1053	Ground-Fault Sensing and Relaying Equipment
	UL 1650	Portable Power Cable
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
590	UL 496	Lampholders
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 588	Seasonal and Holiday Decorative Products
	UL 817	Cord Sets
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1088	Temporary Lighting Strings
	UL 1377	Wire used in Low Voltage Seasonal Lighting Products In Circuits With a Maximum Available Power of 15W
600	UL 1	Flexible Metal Conduit
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 13	Power-Limited Circuit Cables
	UL 48	Electric Signs
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems
	UL 814	Gas-Tube-Sign Cable
	UL 879	Electric Sign Components
	UL 879A	LED Sign and Sign Retrofit Kits
	UL 879B	Polymeric Enclosure Systems for the Splice Between Neon Tubing Electrode Leads and GTO Cable, and the GTO Cable Leading to the Splice
	UL 943	Ground-Fault Circuit-Interrupters
	UL 1310	Class 2 Power Units
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection
	Ul 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2161	Neon Transformers and Power Supplies
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
	UL 3001	Distributed Energy Generation and Storage Systems
	UL 3003	Distributed Generation Cables
	UL 3703	Solar Trackers
	UL 4703	Photovoltaic Wire
	UL 6703	Connectors for Use in Photovoltaic Systems
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings
	UL 8703	Concentrator Photovoltaic Modules and Assemblies
	UL 9703	Distributed Generation Wiring Harnesses
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements For Construction

Article	Standard Number	Standard Title
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements For Testing
	UL 62109	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
604	UL 1	Flexible Metal Conduit
	UL 4	Armored Cable
	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL 5B	Strut-Type Channel Raceways and Fittings
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
	UL 62	Flexible Cords and Cables
	UL 183	Manufactured Wiring Systems
	UL 209	Cellular Metal Floor Raceways and Fittings
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 797	Electrical Metallic Tubing — Steel
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel
	UL 857	Busways
	UL 1569	Metal-Clad Cables
	UL 2024	Cable Routing Assemblies and Communications Raceways
605	UL 962	Household and Commercial Furnishings
	UL 1286	Office Furnishings Systems
	UL 1310	Class 2 Power Units
	UL 2999	Individual Commercial Office Furnishings
	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
610	UL 62	Flexible Cords and Cables
	UL 2273	Festoon Cable
620	UL 62	Flexible Cords and Cables
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 98	Enclosed and Dead-Front Switches
	UL 104	Elevator Door Locking Devices and Contacts
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 508A	Industrial Control Panels
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1310	Class 2 Power Units
	UL 1449	Surge Protective Devices
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 2556	Wire and Cable Test Methods
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
625	UL 62	Flexible Cords And Cables
	UL 1650	Portable Power Cable
	UL 2202	Electric Vehicle (EV) Charging System Equipment
	UL 2231-1	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 1: General Requirements
	UL 2231-2	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 2: Particular Requirements for Protection Devices for Use in Charging Systems

Article	Standard Number	Standard Title
	UL 2251	Plugs, Receptacles and Couplers for Electrical Vehicles
	UL 2580	Batteries for Use in Electric Vehicles
	UL 2594	Electric Vehicle Supply Equipment
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)
626	UL 62	Flexible Cords and Cables
	UL 231	Power Outlets
	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 817	Cord Sets and Power-Supply Cords
	UL 1651	Optical Fiber Cable
	UL 1686	Pin and Sleeve Configurations
630	UL 551	Transformer-Type Arc-Welding Machines
640	UL 13	Power Limited Circuit Cables
	UL 62	Flexible Cords and Cables
	UL 813	Commercial Audio Equipment
	UL 1310	Class 2 Power Units
	UL 1419	Professional Video and Audio Equipment
	UL 1492	Audio-Video Products and Accessories
	UL 1711	Amplifiers for Fire Protective Signaling Systems
	UL 2269	Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes
	UL 6500	Audio/Video and Musical Instrument Apparatus for Household, Commercial, and Similar General Use
	UL 60065	Audio, Video and Similar Electronic Apparatus — Safety Requirements
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
645	UL 38	Manual Signaling Boxes for Fire Alarm Systems
	UL 268	Smoke Detectors for Fire Alarm Systems
	UL 444	Communications Cables
	UL 464	Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
	UL 497B	Protectors for Data Communications and Fire Alarm Circuits
	UL 833	Control Units and Accessories for Fire Alarm Systems
	UL 864	Control Units and Accessories for Fire Alarm Systems
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits
	UL 1425	Cables for Non-Power-Limited Fire-Alarm Circuits
	UL 1449	Surge Protective Devices
	UL 1480	Speakers for Fire Alarm and Signaling Systems, Including Accessories
	UL 1638	Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
	UL 1651	Optical Fiber Cable
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 1690	Data-Processing Cable
	UL 1778	Uninterruptible Power Systems
	UL 2024	Cable Routing Assemblies and Communications Raceways
	UL 60950-1	Information Technology Equipment Safety — Part 1: General Requirements
	UL 60950-21	Information Technology Equipment Safety — Part 21: Remote Power Feeding
	UL 60950-22	Information Technology Equipment Safety — Part 22: Equipment to be Installed Outdoors

Article	Standard Number	Standard Title
	UL 60950-23	Information Technology Equipment Safety — Part 23: Large Data Storage Equipment
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
646	UL 10C	Positive Pressure Fire Tests of Door Assemblies
	UL 62	Flexible Cords and Cables
	UL 67	Panelboards
	UL 98	Enclosed and Dead-Front Switches
	UL 305	Panic Hardware
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 508	Industrial Control Equipment
	UL 508A	Industrial Control Panels
	UL 845	Motor Control Centers
	UL 869A	Reference Standard for Service Equipment
	UL 891	Switchboards
	UL 924	Emergency Lighting and Power Equipment
	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 1062	Unit Substations
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1429	Pullout Switches
	UL 1449	Surge Protective Devices
	UL 1655	Community-Antenna Television Cables
	UL 1989	Standby Batteries
	UL 2755	Modular Data Centers
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
647	UL 1598	Luminaires
650	UL 1310	Class 2 Power Units
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
670	ANSI/CSA-C22.2 No. 19085-1	Woodworking machines — Safety — Part 1: Common requirements
	UL 508	Industrial Control Equipment
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
675	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
680	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 20	General Use Snap-Switches
	UL 62	Flexible Cords and Cables
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 379	Power Units for Fountain, Swimming Pool, and Spa Luminaires

Article	Standard Number	Standard Title
	UL 467	Grounding and Bonding Equipment
	UL 486D	Sealed Wire Connector Systems
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 676	Underwater Luminaires and Submersible Junction Boxes
	UL 676A	Potting Compounds for Swimming Pool, Fountain, and Spa Equipment
	UL 943	Ground-Fault Circuit-Interrupters
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters
	UL 1004-10	Pool Pump Motors
	UL 1081	Swimming Pool Pumps, Filters, and Chlorinators
	UL 1241	Junction Boxes for Swimming Pool Luminaires
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1261	Electric Water Heaters for Pools and Tubs
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment
	UL 1569	Metal-Clad Cables
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 1795	Hydromassage Bathtubs
	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 2452	Electric Swimming Pool and Spa Cover Operators
	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
	UL 2995	Lifts for Swimming Pools and Spas
	UL 60335-2-1000	Household and Similar Electrical Appliances: Particular Requirements for Electrically Powered Pool Lifts
682	UL 486D	Sealed Wire Connector Systems
	UL 1650	Portable Power Cable
	UL 1838	Low Voltage Landscape Lighting Systems
690	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses
	UL 467	Grounding and Bonding Equipment
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems
	UL 1569	Metal-Clad Cables
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection
	UL 1703	Flat-Plate Photovoltaic Modules and Panels
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
	UL 3001	Distributed Energy Generation and Storage Systems
	UL 3003	Distributed Generation Cables
	UL 3005	Distributed Energy Resource Management Systems
	UL 3703	Solar Trackers
	UL 3730	Photovoltaic Junction Boxes
	UL 3741	Photovoltaic Hazard Control
	UL 4703	Photovoltaic Wire
	UL 6703	Connectors for Use in Photovoltaic Systems
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings

Article	Standard Number	Standard Title
	UL 8703	Concentrator Photovoltaic Modules and Assemblies
	UL 8801	Photovoltaic Luminaire Systems
	UL 9703	Distributed Generation Wiring Harnesses
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements for Construction
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements for Testing
	UL 62109-1	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
692	UL 2262	Fuel Cell Modules for Use in Portable and Stationary Equipment
	UL 2262A	Borohydride Fuel Cartridges with Integral Fuel Processing for Use with Portable Fuel Cell Power Systems or Similar Equipment
	UL 2265	Fuel Cell Power Units and Fuel Storage Containers for Portable Devices
	UL 2265A	Hand-held or Hand-Transportable Fuel Cell Power Units with Disposable Methanol Fuel Cartridges for use in Original Equipment Manufacturer's Information Technology Equipment
	UL 2265C	Hand-Held or Hand-Transportable Alkaline (Direct Borohydride) Fuel Cell Power Units and Borohydride Fuel Cartridges For Use With Consumer Electronics or Information Technology Equipment
	UL 2266	Electromagnetic Compatibility, Electrical Safety, and Physical Protection of Stationary and Portable Fuel Cell Power Systems for Use with Commercial Network Telecommunications Equipment
	UL 2267	Fuel Cell Power Systems for Installation in Industrial Electric Trucks
694	UL 467	Grounding and Bonding Equipment
	UL 489C	Molded-Case Circuit Breakers and Molded-Case Switches for Use with Wind Turbines
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2227	Flexible Motor Supply Cable and Wind Turbine Tray Cable
	UL 2736	Single Pole Separable Interconnecting Cable Connectors for Use with Wind Turbine Generating Systems
	UL 4143	Wind Turbine Generator — Life Time Extension (LTE)
	UL 6141	Wind Turbines Permitting Entry of Personnel
	UL 6142	Wind Turbine Generating Systems — Small
695	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 218	Fire Pump Controllers
	UL 448	Centrifugal Stationary Pumps for Fire-Protection Service
	UL 448B	Residential Fire Pumps Intended for One- and Two-Family Dwellings and Manufactured Homes
	UL 448C	Stationary, Rotary-Type, Positive-Displacement Pumps for Fire Protection Service
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
	UL 1004-5	Fire Pump Motors
	UL 1242	Electrical Intermediate Metal Conduit — Steel
	UL 1569	Metal-Clad Cables
	UL 1724	Fire Tests for Electrical Circuit Protective Systems
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
700	UL 924	Emergency Lighting and Power Equipment

Article	Standard Number	Standard Title
	UL 1008	Transfer Switch Equipment
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
	UL 1449	Surge Protective Devices
	UL 1724	Fire Tests for Electrical Circuit Protective Systems
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 2200	Stationary Engine Generator Assemblies
701	UL 924	Emergency Lighting and Power Equipment
	UL 1008	Transfer Switch Equipment
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts
702	UL 98	Enclosed and Dead-Front Switches
	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
705	UL 62	Flexible Cords and Cables
	UL 98	Enclosed and Dead-Front Switches
	UL 486D	Sealed Wire Connector Systems
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1429	Pullout Switches
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 2200	Stationary Engine Generator Assemblies
	UL 3003	Distributed Generation Cables
	UL 6141	Wind Turbines Permitting Entry of Personnel
	UL 6142	Small Wind Turbine Systems
	UL 9540	Energy Storage Systems and Equipment
	UL 62109-2	Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters
706	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 248-6	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
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses
	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
	UL 489H	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures, for Use with Direct Current (DC) Microgrids
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
	UL 9540	Energy Storage Systems and Equipment

Article	Standard Number	Standard Title
708	UL 1	Flexible Metal Conduit
	UL 4	Armored Cable
	UL 83	Thermoplastic-Insulated Wires and Cables
	UL 360	Liquid-Tight Flexible Metal Conduit
	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables
	UL 497A	Secondary Protectors for Communications Circuits
	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 1569	Metal-Clad Cables
	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
	UL 2200	Stationary Engine Generator Assemblies
	UL 8801	Photovoltaic Luminaire Systems
	UL 9540	Energy Storage Systems and Equipment
	UL 62109-1	Power Converters for use in Photovoltaic Power Systems — Part 1: General Requirements
	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
	UL 444	Standard for Safety for Communications Cables
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits
	UL 1651	Optical Fiber Cable
	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

Article	Standard Number	Standard Title
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	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
	UL 9990	Information and Communication Technology (ICT) Power Cables
	UL 61010-2-201	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-201: Particular Requirements for Control Equipment
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy
	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
	UL 1400-2	Fault-Managed Power Systems — Part 2 Requirements for Cables
	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
	UL 2556	Wire and Cable Test Methods
728	UL 5	Surface Metal Raceways and Fittings
	UL 5A	Nonmetallic Surface Raceways and Fittings
	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
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables

Article	Standard Number	Standard Title
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric Actuators
770	UL 467	Grounding and Bonding Equipment
	UL 568	Nonmetallic Cable Tray Systems
	UL 1651	Optical Fiber Cable
	UL 2024	Optical Fiber and Communication Cable Raceway
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
800	UL 444	Communications Cables
	UL 467	Grounding and Bonding Equipment
	UL 489A	Circuit Breakers for Use in Communication Equipment
	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
	UL 568	Nonmetallic Cable Tray Systems
	UL 723	Test for Surface Burning Characteristics of Building Materials
	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
	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
	UL 719	Nonmetallic-Sheathed Cables
	UL 1310	Class 2 Power Units
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
	UL 1863	Communication Circuit Accessories
	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
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
810	UL 150	Antenna Rotators
	UL 452	Antenna-Discharge Units
	UL 467	Grounding and Bonding Equipment
	UL 497E	Protectors for Antenna Lead-In Conductors
820	UL 444	Communications Cables
	UL 497E	Protectors for Antenna Lead-In Conductors
	UL 1655	Community-Antenna Television Cables
830	UL 444	Communications Cables
	UL 497A	Secondary Protectors for Communications Circuits

Article	Standard Number	Standard Title
	UL 497C	Protectors for Coaxial Communications Circuits
	UL 497E	Protectors for Antenna Lead-In Conductors
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
840	UL 444	Communications Cables
	UL 467	Grounding and Bonding Equipment
	UL 498A	Current Taps and Adapters
	UL 1310	Class 2 Power Units
	UL 1651	Optical Fiber Cable
	UL 1863	Communication Circuit Accessories
	UL 2024	Cable Routing Assemblies and Communications Raceways
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
Tables 11(A) and 11(B)	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
Tables 12(A) and 12(B)	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

Article	Standard Number	Standard Title
	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
	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

Article	Standard Number	Standard Title
	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

Article	Standard Number	Standard Title
	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

Article	Standard Number	Standard Title
	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
	NFPA 88A	Standard for Parking Structures
512	ICC IFC	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
	NFPA 409	Standard on Aircraft Hangars
514	NFPA 2	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

Article	Standard Number	Standard Title
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

File Name	Description	Approved
PI_AnnexA_2026_2023-08-30.pdf	Informative Annex A Product Safety Standards - Tables A.1(a) and A.1(b)	
PI_AnnexA_2026_TitleCorrectionsOnly_2023-08-30.pdf	Title Corrections Excerpted from Tables A.1(a) and A.1(b)	

Statement of Problem and Substantiation for Public Input

Revise Annex A Tables A.1(a) and A.1(b) with proposed changes in the attached file as follows:

1. Edition number and publication date added for referenced UL standards: All referenced UL standards are provided with the most recent edition number and publication date. Note that non-UL standards' edition numbers and publication dates are not included.

2. Corrections to existing standard titles: UL standard titles have been updated to match the current UL standard titles. These corrections are also provided in a separately attached file to aid staff and technical committee members in

identifying changes.

3. Withdrawn standards: The following UL standards are proposed to be deleted.
o UL 2305 Convention Center Cord Sets
o UL 3005 Distributed Energy Resource Management Systems.

4. Standards in development: UL standards not published at the PI deadline are identified as "TBD" (to be determined). The publication date will be provided as a public comment for the second draft.
o UL 60079-10-1 Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive Gas Atmospheres (Article 505)
o UL 62784 Vacuum Cleaners and Dust Extractors Providing Equipment Protection Level Dc for the Collection of Combustible Dusts — Particular Requirements (Article 506)
o UL 62109-2 Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters (Articles 690, 705, and 710)
o UL 3010 Single Site Energy Systems (Articles 445, 625, 690, 691, 692, 694, 705, and 710)
o UL 1399 Leakage Current Measurement Devices for Use in Marina Applications (Article 555)

Submitter Information Verification

Submitter Full Name: Charles Mercier
Organization: UL Standards & Engagement
Affiliation: UL Standards & Engagement
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 22 16:37:40 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-9025-NFPA 70-2024
Statement: The informative Annex A was revised to include new standards, delete withdrawn standards, and update the edition years in compliance with the NEC Style Manual and the Regulations Governing the Development of NFPA Standards.

Informative Annex A Product Safety Standards - Tables A.1(a) and A.1(b)

Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title	Edition	Publication Date
110	UL 10C	Positive Pressure Fire Tests of Door Assemblies	3	06/09/2016
	UL 305	Panic Hardware	6	07/12/2012
	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 2043	Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces	4	10/02/2013
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
210	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 935	Fluorescent-Lamp Ballasts	10	05/21/2001
	UL 943	Ground-Fault Circuit Interrupters	5	05/17/2016
	UL 1029	High-Intensity-Discharge Lamp Ballasts	5	05/25/1994
	UL 1699	Arc-Fault Circuit-Interrupters	3	05/03/2017
	UL 1699A	Outlet Branch Circuit ~~AFCIs~~ Arc-Fault Circuit-Interrupters	2	03/17/2010
225	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
230	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 67	Panelboards	13	05/15/2018
	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 218	Fire Pump Controllers	3	09/16/2015
	UL 231	Power Outlets	10	10/05/2016
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers	7	11/23/2020
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 414	Meter Sockets	9	01/05/2016
	UL 486A-486B	Wire Connectors	3	04/27/2018
	UL 486C	Splicing Wire Connectors	7	01/26/2018
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 508A	Industrial Control Panels	3	04/24/2018
	UL 514B	Conduit, Tubing and Cable Fittings	6	07/13/2012
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 845	Motor Control Centers	6	06/28/2021
	UL 857	Busways	13	03/25/2009
	UL 869A	Reference Standard for Service Equipment	4	11/10/2006
	UL 891	Switchboards	12	07/19/2019
	UL 977	Fused Power-Circuit Devices	5	04/30/2012
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
	UL 1008M	Meter-Mounted Transfer Switches	3	08/01/2022
	UL 1008S	Solid-State Transfer Switches	1	11/15/2012
	UL 1053	Ground-Fault Sensing and Relaying Equipment	7	08/05/2015
	UL 1062	Unit Substations	3	01/29/1997
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006

	UL 1429	Pullout Switches	4	04/18/2000
	UL 1449	Surge Protective Devices	5	01/08/2021
	UL 1558	Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear	5	02/18/2016
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 1740	Robots and Robotic Equipment	4	01/26/2018
	UL 1953	Power Distribution Blocks	7	07/01/2020
	UL 2011	Machinery	7	11/10/2022
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
	UL 2416	Audio/Video, Information and Communication Technology Equipment Cabinet, Enclosure and Rack Systems	1	03/11/2015
	UL 2446	Unitary Boiler Room Systems	1	10/13/2004
	UL 2565	Industrial Metalworking and Woodworking Machine Tools	1	05/01/2013
	UL 2735	Electric Utility Meters	1	05/30/2013
	UL 2745	Meter Socket Adapters for Communications Equipment	1	03/31/2011
	UL 2876	Remote Racking Devices for Switchgear and Controlgear	1	07/24/2014
	UL 4248-1	Fuseholders — Part 1: General Requirements	3	03/31/2022
	UL 60947-1	Low-Voltage Switchgear and Controlgear — Part 1: General Rules	6	05/31/2022
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy	1	06/08/2012
240	UL 248-1	Low-Voltage Fuses — Part 1: General Requirements	4	10/24/2022
	UL 248-2	Low-Voltage Fuses — Part 2: Class C Fuses	2	08/01/2000
	UL 248-3	Low-Voltage Fuses — Part 2: Class CA and CB Fuses	2	08/01/2000
	UL 248-4	Low-Voltage Fuses — Part 4: Class CC Fuses	2	08/01/2000
	UL 248-5	Low-Voltage Fuses — Part 5: Class G Fuses	2	08/01/2000
	UL 248-6	Low-Voltage Fuses — Part 6: Class H Non-Renewable Fuses	2	08/01/2000
	UL 248-8	Low-Voltage Fuses — Part 8: Class J Fuses	3	05/13/2011
	UL 248-9	Low-Voltage Fuses — Part 9: Class K Fuses	2	08/01/2000
	UL 248-10	Low-Voltage Fuses — Part 10: Class L Fuses	3	05/13/2011
	UL 248-11	Low-Voltage Fuses — Part 11: Plug Fuses	3	05/13/2011
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses	3	05/13/2011
	UL 248-15	Low-Voltage Fuses — Part 15: Class T Fuses	3	03/09/2018
	UL 248-17	Low-Voltage Fuses — Part 17: Class CF Fuses	5	09/13/2018
	UL 248-18	Low-Voltage Fuses — Part 18: Class CD Fuses	1	03/31/2022
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker	13	10/24/2016
	UL 489I	Solid State Molded-Case Circuit Breakers	2	03/14/2022
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 1053	Ground-Fault Sensing and Relaying Equipment	7	08/05/2015
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 4248-1	Fuseholders — Part 1: General Requirements	3	03/31/2022
242	UL 1449	Surge Protective Devices	5	01/08/2021
250	UL 1	Flexible Metal Conduit	11	02/16/2005
	UL 4	Armored Cable	15	01/16/2004
	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 486A-486B	Wire Connectors	3	04/27/2018
	UL 486C	Splicing Wire Connectors	7	01/26/2018
	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 504	Mineral-Insulated, Metal-Sheathed Cable	2	09/22/2022
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 797	Electrical Metallic Tubing — Steel	9	11/30/2007

	UL 797A	Electrical Metallic Tubing — Aluminum	3	01/30/2014
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 1652	Flexible Metallic Tubing	3	06/20/2006
300	UL 4	Armored Cable	15	01/16/2004
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 263	Fire Tests of Building Construction and Materials	14	06/21/2011
	UL 504	Mineral-Insulated, Metal-Sheathed Cable	2	09/22/2022
	UL 746C	Polymeric Materials — Use in Electrical Equipment Evaluations	7	02/05/2018
	UL 1569	Metal-Clad Cable	5	05/04/2018
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords	4	10/31/2001
	UL 2239	Hardware for Support of Conduit, Tubing and Cable	2	02/20/2015
	UL 2556	Wire and Cable Test Methods	5	04/30/2021
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
310	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 224	Extruded Insulating Tubing	7	05/05/2021
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 1441	Coated Electrical Sleeving	5	06/21/2021
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 93ºC and Copper-to-Copper Conductors Designed for Normal Operation at or		
	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	15	01/16/2004
	UL 504	Mineral-Insulated, Metal-Sheathed Cable	2	09/22/2022
	UL 1072	Medium Voltage Power Cables	4	06/30/2006
	UL 1569	Metal-Clad Cable	5	05/04/2018
312	UL 50	Enclosures for Electrical Equipment	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 916	Energy Management Equipment	5	10/22/2015
	UL 2808	Energy Monitoring Equipment	1	07/22/2020
	UL 61010-1 ~~and UL 61010-2-030~~	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements ~~Part 2-030: Particular Requirements for Testing and Measuring Circuits~~	3	05/11/2012
	UL 61010-2-030	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-030: Particular Requirements for Testing and Measuring Circuits	2	12/21/2018
314	UL 50	Enclosures for Electrical Equipment	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498B	Receptacles with Integral Switching Means	1	08/19/2022
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 514A	Metallic Outlet Boxes	11	02/01/2013

	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices	2	06/28/2013
	UL 1953	Power Distribution Blocks	7	07/01/2020
320	UL 4	Armored Cable	15	01/16/2004
	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 1565	Positioning Devices	6	07/29/2022
	UL 2239	Hardware for the Support of Conduit, Tubing, and Cable	2	02/20/2015
322	UL 486A-486B	Wire Connectors	3	04/27/2018
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
324	UL 486A-486B	Wire Connectors	3	04/27/2018
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
330	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 66	Fixture Wire	3	01/18/2023
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 1565	Positioning Devices	6	07/29/2022
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 2225	Cables and Cable-Fittings For Use In Hazardous (Classified) Locations	4	09/30/2013
	UL 2239	Hardware for the Support of Conduit, Tubing, and Cable	2	02/20/2015
332	UL 504	Mineral-Insulated, Metal-Sheathed Cable	2	09/22/2022
	UL 514B	Conduit, Tubing and Cable Fittings	6	07/13/2012
334	UL 719	Nonmetallic-Sheathed Cables	13	09/08/2015
	UL 2256	Nonmetallic Sheathed Cable Interconnects	1	06/29/2001
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
335	UL 2250	Instrumentation Tray Cable	3	03/30/2017
336	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members	6	09/12/2018
	UL 2225	Cables and Cable-Fittings For Use In Hazardous (Classified) Locations	4	09/30/2013
337	UL 1309A	Cable for Use in Mobile Installations	1	09/03/2020
338	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 854	Service-Entrance Cables	12	01/10/2020
340	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables	10	12/10/2018
342	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
344	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
348	UL 1	Flexible Metal Conduit	11	02/16/2005
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
350	UL 360	Liquid-Tight Flexible Steel Conduit	7	01/17/2013
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
352	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
353	UL 651A	Schedule 40 and 80 High Density Polyethylene (HDPE) Conduit	5	10/26/2011
354	UL 1990	Nonmetallic Underground Conduit with Conductors	3	11/22/2013

355	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	1	07/30/2009
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
	UL 2515A	Supplemental Requirements for Extra-Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	1	11/21/2011
356	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
358	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 797	Electrical Metallic Tubing — Steel	9	11/30/2007
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel	3	01/30/2014
360	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 1652	Flexible Metallic Tubing	3	06/20/2006
362	UL 1653	Electrical Nonmetallic Tubing	3	02/15/2019
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
366	UL 870	Wireways, Auxiliary Gutters, and Associated Fittings	9	03/03/2016
368	UL 509	Bus Drop Cable	2	01/26/2015
370	ANSI/CSA C22.2 No. 273	Cablebus		
374	UL 209	Cellular Metal Floor Raceways and Fittings	10	12/20/2011
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
376	UL 870	Wireways, Auxiliary Gutters, and Associated Fittings	9	03/03/2016
	UL 1953	Power Distribution Blocks	7	07/01/2020
378	UL 870	Wireways, Auxiliary Gutters, and Associated Fittings	9	03/03/2016
382	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
	UL183	Manufactured Wiring Systems	4	09/22/2009
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498M	Marine Shore Power Inlets	1	07/29/2020
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices	2	06/28/2013
	UL 746C	Polymeric Materials — Use in Electrical Equipment Evaluations	7	02/05/2018
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 991	Tests for Safety-Related Controls Employing Solid-State Devices	3	10/22/2004
	UL 1077	Supplementary Protectors for Use in Electrical Equipment	7	06/25/2015
	UL 1699	Arc-Fault Circuit-Interrupters	3	05/03/2017
	UL 1998	Software in Programmable Components	3	12/18/2013
384	UL 5B	Strut-Type Channel Raceways and Fittings	2	04/14/2004
386	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
388	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
392	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
393	UL 13	Power-Limited Circuit Cables	4	03/18/2015
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 2043	Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces	4	10/02/2013
	UL 2577	Suspended Ceiling Power Grid Systems and Equipment	1	02/07/2013
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
396	UL 1072	Medium-Voltage Power Cables	4	06/30/2006

404	UL 20	General-Use Snap Switches	14	07/20/2018
	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 98A	Open-Type Switches	2	07/11/2014
	UL 363	Knife Switches	11	08/12/2011
	UL 489	Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches	13	10/24/2016
	UL 773	Plug-In Locking Type Photocontrols for Use with Area Lighting	5	03/18/2016
	UL 773A	Nonindustrial Photoelectric Switches for Lighting Control	6	01/19/2016
	UL 917	Clock-Operated Switches	5	11/10/2006
	UL 977	Fused Power-Circuit Devices	5	04/30/2012
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1472	Solid-State Dimming Controls	2	09/25/2015
	UL 1429	Pullout Switches	4	04/18/2000
	UL 60730-1	Automatic Electrical Controls — Part 1: General Requirements	5	08/03/2016
	UL 60730-2	Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches	3	11/16/2020
	UL 60730-2-7	Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches	2	03/21/2014
	ANSI/NEMA WD 6–2016	Wiring Devices — Dimensional Specifications		
406	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498B	Receptacles with Integral Switching Means	1	08/19/2022
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498M	Marine Shore Power Inlets	1	07/29/2020
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices	2	06/28/2013
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 943B	Appliance Leakage-Current Interrupters	3	12/04/2017
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters	2	11/02/2012
	UL 970	Retail Fixtures and Merchandising Displays	1	02/20/2020
	UL 1286	Office Furnishings Systems	6	06/29/2022
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1682	Plugs, Receptacles, and Cable Connectors, of the Pin and Sleeve Type	5	02/15/2017
	UL 1691	Single Pole Locking-Type Separable Connectors	2	09/29/2021
	UL 1699	Arc-Fault Circuit-Interrupters	3	05/03/2017
	UL 2999	Individual Commercial Office Furnishings	1	05/22/2020
408	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 67	Panelboards	13	05/15/2018
	UL 891	Switchboards	12	07/19/2019
	UL 1558	Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear	5	02/18/2016
409	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 508A	Industrial Control Panels	3	04/24/2018
410	ANSI/CSA-C22.2 No. 184.2	Solid-State Controls for Lighting Systems (SSCLS)		
	UL 153	Portable Electric Luminaires	13	03/03/2014
	UL 496	Lampholders	14	09/05/2017
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498B	Receptacles with Integral Switching Means	1	08/19/2022
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020

	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 542	Fluorescent Lamp Starters	9	07/11/2005
	UL 588	Seasonal and Holiday Decorative Products	19	10/26/2015
	UL 935	Fluorescent-Lamp Ballasts	10	05/21/2001
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 970	Retail Fixtures and Merchandising Displays	1	02/20/2020
	UL 1029	High-Intensity-Discharge Lamp Ballasts	5	05/25/1994
	UL 1029A	Ignitors and Related Auxiliaries for HID Lamp Ballasts	1	10/09/2006
	UL 1574	Track Lighting Systems	3	09/07/2004
	UL 1598	Luminaires	3	09/17/2008
	UL 1598B	Luminaire Reflector Kits for Installation on Previously Installed Fluorescent Luminaires, Supplemental Requirements	1	12/04/2000
	UL 1598C	Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits	1	01/16/2014
	UL 1993	Self-Ballasted Lamps and Lamp Adapters	5	01/27/2017
	UL 2388	Flexible Lighting Products	2	05/03/2017
	UL 8750	Light Emitting Diode (LED) Equipment for Use in Lighting Products	2	09/15/2015
	UL 8752	Organic Light Emitting Diode (OLED) Panels	1	06/13/2012
	UL 8753	Field-Replaceable Light Emitting Diode (LED) Light Engines	1	07/31/2013
	UL 8754	Holders, Bases and Connectors for Solid-State (LED) Light Engines and Arrays	1	07/31/2013
	UL 8800	Horticultural Lighting Equipment and Systems	1	08/30/2019
411	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1838	Low-Voltage Landscape Lighting Systems	3	01/13/2003
	UL 2108	Low-Voltage Lighting Systems	2	12/07/2015
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers	1	04/17/2006
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	6	05/30/2008
	UL 73	Motor-Operated Appliances	10	03/02/2011
	UL 82	Electric Gardening Appliances	9	08/31/2017
	UL 122	Photographic Equipment	5	10/29/2007
	UL 141	Garment Finishing Appliances	9	03/30/2011
	UL 174	Household Electric Storage Tank Water Heaters	11	04/29/2004
	UL 197	Commercial Electric Cooking Appliances	10	03/17/2010
	UL 283	Air Fresheners and Deodorizers	3	06/16/2015
	UL 399	Drinking Water Coolers	8	03/30/2017
	UL 430	Waste Disposers	8	09/08/2015
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 499	Electric Heating Appliances	14	11/07/2014
	UL 507	Electric Fans	10	11/09/2017
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 515	Electrical Resistance Trace Heating for Commercial Applications	2	07/17/2015
	UL 561	Floor Finishing Machines	7	10/31/2011
	UL 574	Electric Oil Heaters	8	08/14/2003
	UL 621	Ice Cream Makers	7	05/07/2010
	UL 705	Power Ventilators	7	07/19/2017
	UL 710B	Recirculating Systems	2	09/02/2011
	UL 749	Household Dishwashers	10	03/16/2017
	UL 751	Vending Machines	9	07/18/2016

UL 763	Motor-Operated Commercial Food Preparing Machines	5	02/28/2018
UL 778	Motor-Operated Water Pumps	6	07/07/2016
UL 834	Heating, Water Supply, and Power Boilers — Electric	5	04/13/2004
UL 858	Household Electric Ranges	16	11/07/2014
UL 875	Electric Dry-Bath Heaters	9	05/21/2009
UL 921	Commercial Dishwashers	8	01/30/2020
UL 923	Microwave Cooking Appliances	7	05/01/2013
UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
UL 962	Household and Commercial Furnishings	4	11/07/2014
UL 962A	Furniture Power Distribution Units	5	06/12/2018
UL 979	Water Treatment Appliances	2	09/29/2016
UL 982	Motor-Operated Household Food Preparing Machines	8	09/27/2019
UL 987	Stationary and Fixed Electric Tools	8	10/19/2011
UL 1017	Vacuum Cleaners, Blower Cleaners, and Household Floor Finishing Machines	10	09/15/2017
UL 1026	Household Electric Cooking and Food Serving Appliances	6	01/27/2012
UL 1086	Household Trash Compactors	6	08/15/2016
UL 1090	Electric Snow Movers	7	10/05/2016
UL 1206	Electric Commercial Clothes-Washing Equipment	4	04/22/2003
UL 1240	Electric Commercial Clothes-Drying Equipment	4	10/04/2005
UL 1278	Movable and Wall- or Ceiling-Hung Electric Room Heaters	4	03/21/2014
UL 1447	Electric Lawn Mowers	6	10/13/2017
UL 1450	Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment	4	05/05/2010
UL 1453	Electric Booster and Commercial Storage Tank Water Heaters	6	03/29/2016
UL 1576	Flashlights and Lanterns	2	05/13/2022
UL 1594	Sewing and Cutting Machines	4	04/18/2008
UL 1647	Motor-Operated Massage and Exercise Machines	6	08/03/2015
UL 1727	Commercial Electric Personal Grooming Appliances	5	05/21/2012
UL 1776	High-Pressure Cleaning Machines	3	06/07/2002
UL 2157	Electric Clothes Washing Machines and Extractors	3	11/02/2015
UL 2158	Electric Clothes Dryers	5	04/06/2018
UL 2565	Industrial Metalworking and Woodworking Machine Tools	1	05/01/2013
UL 60335-2-3	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electric Irons	5	07/14/2004
UL 60335-2-8	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Shavers, Hair Clippers, and Similar Appliances	6	06/25/2018
UL 60335-2-24	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances, and Ice-Makers	2	04/28/2017
UL 60335-2-40	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	3	11/01/2019
UL 60335-2-67	Household and Similar Electrical Appliances — Safety — Part 2-67: Particular Requirements for Floor Treatment Machines, For Commercial Use	1	12/22/2017
UL 60335-2-68	Household and Similar Electrical Appliances — Safety — Part 2-68: Particular Requirements for Spray Extraction Machines, for Commercial Use	1	05/08/2020
UL 60335-2-79	Household and Similar Electrical Appliances — Safety — Part 2-79: Particular Requirements for High Pressure Cleaners and Steam Cleaners	1	01/14/2016
UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls	3	10/13/2010
UL 60745-1	Hand-Held Motor-Operated Electric Tools — Safety — Part 1: General	4	07/31/2007
UL 60745-2-1	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-1: Particular Requirements for Drills and Impact Drills	2	03/26/2004
UL 60745-2-2	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-2: Particular Requirements for Screwdrivers and Impact Wrenches	2	03/26/2004
UL 60745-2-3	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-3: Particular Requirements for Grinders, Polishers, and Disk-Type Sanders	2	05/31/2007

UL 60745-2-4	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type	2	03/26/2004
UL 60745-2-5	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-5: Particular Requirements for Circular Saws	5	03/20/2012
UL 60745-2-6	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-6: Particular Requirements for Hammers	2	03/26/2004
UL 60745-2-8	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-8: Particular Requirements for Shears and Nibblers	2	03/26/2004
UL 60745-2-9	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-9: Particular Requirements for Tappers	2	03/26/2004
UL 60745-2-11	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-11: Particular Requirements for Reciprocating Saws	2	03/26/2004
UL 60745-2-12	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-12: Particular Requirements For Concrete Vibrators	2	03/21/2005
UL 60745-2-13	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-13: Particular Requirements For Chain Saws	1	12/08/2011
UL 60745-2-14	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-14: Particular Requirements for Planers	2	03/26/2004
UL 60745-2-15	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-15: Particular Requirements for Hedge Trimmers	1	06/28/2010
UL 60745-2-16	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-16: Particular Requirements for Tackers	1	11/18/2009
UL 60745-2-17	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-17: Particular Requirements for Routers and Trimmers	3	02/25/2011
UL 60745-2-18	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-18: Particular Requirements For Strapping Tools	1	03/21/2005
UL 60745-2-19	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-19: Particular Requirements for Jointers	1	11/25/2005
UL 60745-2-20	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-20: Particular Requirements for Band Saws	1	03/21/2005
UL 60745-2-21	Hand-Held Motor-Operated Electric Tools — Safety — Part 2-21: Particular Requirements For Drain Cleaners	1	03/21/2005
UL 60745-2-22	Hand-Held Motor-Operated electric Tools — Safety — Part 2-22: Particular Requirements for Cut-Off Machines	1	07/20/2012
UL 60745-2-23	Hand-Held Motor-Operated electric Tools — Safety — Part 2-23: Particular Requirements for Die Grinders and Small Rotary Tools	1	09/20/2013
UL 62841-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements	1	02/20/2015
UL 62841-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills	1	04/30/2018
UL 62841-2-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-2: Particular Requirements For Screwdrivers And Impact Wrenches	1	02/26/2016
UL 62841-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders	1	07/12/2021
UL 62841-2-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-4: Particular Requirements For Hand-Held Sanders And Polishers Other Than Disc Type	1	11/30/2015
UL 62841-2-5	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-5: Particular Requirements For Hand-Held	1	08/10/2016
UL 62841-2-8	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-8: Particular Requirements For Hand-Held Shears and Nibblers	1	12/23/2016

	UL 62841-2-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-9: Particular Requirements For Hand-Held Tappers And Threaders	1	02/26/2016
	UL 62841-2-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-10: Particular Requirements For Hand-	1	10/27/2017
	UL 62841-2-11	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-11: Particular Requirements for Hand-Held Reciprocating Saws	1	03/27/2017
	UL 62841-2-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-14: Particular Requirements For Hand-	1	08/12/2016
	UL 62841-2-17	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-17: Particular Requirements For Hand-	1	09/07/2018
	UL 62841-2-21	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-21: Particular Requirements For Hand-Held Drain Cleaners	1	02/01/2018
	UL 62841-3-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1: Particular Requirements For Transportable Table Saws	1	08/29/2016
	UL 62841-3-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-4: Particular Requirements for Transportable Bench Grinders	1	12/23/2016
	UL 62841-3-6	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-6: Particular Requirements For Transportable Diamond Drills with Liquid System	1	06/17/2016
	UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws	2	11/30/2021
	UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular Requirements for Transportable Cut-Off Machines	1	08/05/2016
	UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular Requirements for Transportable Threading Machines	1	04/05/2019
	UL 62841-3-13	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-13: Particular Requirements For	1	05/04/2018
	UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular Requirements for Transportable Drain Cleaners	1	04/05/2019
	UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers	1	12/31/2019
	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws	1	03/06/2020
	UL 62841-4-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-2: Particular Requirements for Hedge	1	09/13/2019
	UL 62841-4-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1000: Particular Requirements For Utility	1	06/19/2020
424	UL 499	Electric Heating Appliances	14	11/07/2014
	UL 1042	Electric Baseboard Heating Equipment	5	08/31/2009
	UL 1673	Electric Space Heating Cables	3	09/13/2010
	UL 1693	Electric Radiant Heating Panels and Heating Panel Sets	3	09/13/2010
	UL 1995	Heating and Cooling Equipment	5	07/31/2015
	UL 1996	Electric Duct Heaters	4	08/31/2009
	UL 2021	Fixed and Location-Dedicated Electric Room Heaters	4	09/30/2015
	UL 2683	Electric Heating Products for Floor and Ceiling Installation	1	02/25/2020

425	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 2021	Fixed and Location-Dedicated Electric Room Heaters	4	09/30/2015
426	IEEE 515	Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications		
	UL 1588	Roof and Gutter De-Icing Cable Units	4	05/24/2002
	UL 2049	Residential Pipe Heating Cable	4	06/21/2006
427	IEEE 515	Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications		
	UL 515	Electrical Resistance Heat Tracing for Commercial Applications	2	07/17/2015
	UL 2049	Residential Pipe Heating Cable	4	06/21/2006
430	UL 4	Armored Cable	15	01/16/2004
	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers	7	11/23/2020
	UL 347A	Medium Voltage Power Conversion Equipment	2	01/05/2021
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 705	Power Ventilators	7	07/19/2017
	UL 745-1	Portable Electric Tools	2	06/15/2007
	UL 845	Motor Control Centers	6	06/28/2021
	UL 987	Stationary and Fixed Electric Tools	8	10/19/2011
	UL 1004-1	Rotating Electrical Machines — General Requirements	2	09/19/2012
	UL 1004-2	Impedance Protected Motors	2	01/10/2014
	UL 1004-3	Thermally Protected Motors	2	02/27/2015
	UL 1004-6	Servo and Stepper Motors	2	06/06/2012
	UL 1004-7	Electronically Protected Motors	3	06/21/2018
	UL 1004-8	Inverter Duty Motors	2	11/13/2013
	UL 1004-9	Form Wound and Medium Voltage Rotating Electrical Machines	1	01/29/2016
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1569	Metal-Clad Cable	5	05/04/2018
	UL 1812	Ducted Heat Recovery Ventilators	4	05/03/2013
	UL 1815	Nonducted Heat Recovery Ventilators	5	02/29/2012
	UL 2565	Industrial Metalworking and Woodworking Machine Tools	1	05/01/2013
	UL 60034-1	Rotating Electrical Machines — Part 1: Rating and Performance	2	09/18/2018
	UL 60335-2-40	Household and Similar Electrical Appliances — Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	3	11/01/2019
	UL 60730-2-22	Automatic Electrical Controls — Part 2: Particular Requirements for Thermal Motor Protectors	1	04/07/2017
	UL 60745-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 1: General Requirements	4	07/31/2007
	UL 60745-2-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-1: Particular Requirements For Hand-Held Drills and Impact Drills	2	03/26/2004
	UL 60745-2-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-2: Particular Requirements For Screwdrivers And Impact Wrenches	2	03/26/2004
	UL 60745-2-3	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-3: Particular Requirements For Hand-Held Grinders, Polishers, and Disk-Type Sanders	2	05/31/2007
	UL 60745-2-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-4: Particular Requirements For Hand-Held Sanders And Polishers Other Than Disc Type	2	03/26/2004
	UL 60745-2-5	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-5: Particular Requirements For Hand-Held	5	03/20/2012

UL 60745-2-8	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-8: Particular Requirements For Hand-Held Shears and Nibblers	2	03/26/2004
UL 60947-1	Low-Voltage Switchgear and Controlgear — Part 1: General Rules	6	05/31/2022
UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters	4	05/31/2022
UL 60947-4-2	Low-Voltage Switchgear and Controlgear — Part 4-2: Contactors and Motor-Starters — AC Semiconductor Motor Controllers and Starters	2	05/31/2022
UL 60947-5-1	Low-Voltage Switchgear and Controlgear — Part 5-1: Control Circuit Devices and Switching Elements — Electromechanical Control Circuit Devices	4	05/31/2022
UL 60947-5-2	Low-Voltage Switchgear and Controlgear — Part 5-2: Control Circuit Devices and Switching Elements — Proximity Switches	4	03/31/2022
UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy	1	06/08/2012
UL 62841-2-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-9: Particular Requirements For Hand-Held Tappers And Threaders	1	02/26/2016
UL 62841-2-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-10: Particular Requirements For Hand-	1	10/27/2017
UL 62841-2-11	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-11: Particular Requirements for Hand-Held Reciprocating Saws	1	03/27/2017
UL 62841-2-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-14: Particular Requirements For Hand-	1	08/12/2016
UL 62841-2-17	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-17: Particular Requirements For Hand-	1	09/07/2018
UL 62841-2-21	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 2-21: Particular Requirements For Hand-Held Drain Cleaners	1	02/01/2018
UL 62841-3-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1: Particular Requirements For Transportable Table Saws	1	08/29/2016
UL 62841-3-4	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-4: Particular Requirements for Transportable Bench Grinders	1	12/23/2016
UL 62841-3-6	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-6: Particular Requirements For Transportable Diamond Drills with Liquid System	1	06/17/2016
UL 62841-3-9	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-9: Particular Requirements For Transportable Mitre Saws	2	11/30/2021
UL 62841-3-10	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-10: Particular requirements for Transportable Cut-Off Machines	1	08/05/2016
UL 62841-3-12	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-12: Particular requirements for Transportable Threading Machines	1	04/05/2019
UL 62841-3-13	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-13: Particular Requirements For	1	05/04/2018
UL 62841-3-14	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-14: Particular requirements for Transportable Drain Cleaners	1	04/05/2019
UL 62841-3-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 3-1000: Particular Requirements for Transportable Laser Engravers	1	12/31/2019

	UL 62841-4-1	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1: Particular Requirements for Chain Saws	1	03/06/2020
	UL 62841-4-2	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-2: Particular Requirements for Hedge	1	09/13/2019
	UL 62841-4-1000	Electric Motor-Operated Hand-Held Tools, Transportable Tools And Lawn And Garden Machinery — Safety — Part 4-1000: Particular Requirements For Utility	1	06/19/2020
440	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 416	Refrigerated Medical Equipment	4	08/30/1993
	UL 484	Room Air Conditioners	9	02/07/2014
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 541	Refrigerated Vending Machines	9	04/21/2016
	UL 563	Ice Makers	8	07/31/2009
	UL 1429	Pullout Switches	4	04/18/2000
	UL 1995	Heating and Cooling Equipment	5	07/31/2015
	UL 60335-2-24	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers	2	04/28/2017
	UL 60335-2-40	Household and Similar Electrical Appliances, Part 2: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	3	11/01/2019
	UL 60335-2-89	Household and Similar Electrical Appliances — Safety — Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor	1	09/29/2017
	UL 60947-4-1	Low-Voltage Switchgear and Controlgear — Part 4-1: Contactors and Motor-Starters — Electromechanical Contactors and Motor-Starters	4	05/31/2022
	UL 60947-4-2	Low-Voltage Switchgear and Controlgear — Part 4-2: Contactors and Motor-Starters — AC Semiconductor Motor Controllers and Starters	2	05/31/2022
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-2: Safety Requirements — Functional	1	06/08/2012
445	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters	2	11/02/2012
	UL 1004-4	Electric Generators	3	07/02/2018
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
450	UL 10C	Positive Pressure Fire Tests of Door Assemblies	3	06/09/2016
	UL 305	Panic Hardware	6	07/12/2012
	UL 340	Tests for Comparative Flammability of Liquids	6	07/24/2017
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric	2	02/27/2013
480	UL 10C	Positive Pressure Fire Tests of Door Assemblies	3	06/09/2016
	UL 305	Panic Hardware	6	07/12/2012
	UL 1642	Lithium Batteries	6	09/29/2020
	UL 1973	Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications	3	02/25/2022
	UL 1989	Standby Batteries	5	10/02/2013
	UL 2054	Household and Commercial Batteries	3	11/17/2021
	UL 4127	Low Voltage Battery Cable	1	09/17/2014
	UL 4128	Intercell and Intertier Connectors for use in Electrochemical Battery System Applications	5	05/13/2020
490	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers	7	11/23/2020
	UL 347A	Medium Voltage Power Conversion Equipment	2	01/05/2021
	UL 347B	Medium Voltage Motor Controllers, Up to 15kV	1	06/20/2005
	UL 347C	Medium Voltage Solid State Resistive Load Controllers, Up to 15kV	1	05/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
500	FM 121303	Guide for Use of Detectors for Flammable Gases		
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements		

	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations		
	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 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment		
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations	6	07/29/2022
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations	4	08/21/2018
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations	6	04/28/2003
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations	9	10/20/2006
	UL 844	Electric Heaters For Use in Hazardous (Classified) Locations	13	06/29/2012
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations	5	02/21/1997
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations	5	11/22/2013
	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations	1	11/25/2019
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations	6	11/14/2022
	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation.	2	09/15/2017
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases	2	05/31/2019
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases	1	08/24/2018
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection	1	05/25/2021
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations	9	09/15/2017
	UL 121303	Guide for Use of Detectors for Flammable Gases	1	09/09/2020
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations	1	08/29/2014
	UL 122701	Requirements for Process Sealing Between Electrical Systems and ~~Potentially~~ Flammable or Combustible Process Fluids	4	09/29/2022
501	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements		
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations		
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment		
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations	6	07/29/2022
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations	6	04/28/2003
	UL 823	~~Standard for~~ Electric Heaters For Use in Hazardous (Classified) Locations	9	10/20/2006
	UL 844	Luminaires for Use in Hazardous (Classified) Locations	13	06/29/2012
	UL 1072	Medium-Voltage Power Cables	4	06/30/2006
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations	5	11/22/2013
	UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members	6	09/12/2018
	UL 1309A	Cable for Use in Mobile Applications	1	09/03/2020
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations	6	11/14/2022
	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation	2	09/15/2017

	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases	2	05/31/2019
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases	1	08/24/2018
	UL 60079-30-1	Explosive Atmospheres — Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection	1	05/25/2021
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations	9	09/15/2017
	UL 122001	General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations	1	08/29/2014
	UL 122701	Requirements for Process Sealing Between Electrical Systems and ~~Potentially~~ Flammable or Combustible Process Fluids	4	09/29/2022
502	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements		
	NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment		
	UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations	6	07/29/2022
	UL 783	Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations	6	04/28/2003
	UL 823	Electric Heaters For Use in Hazardous (Classified) Locations	9	10/20/2006
	UL 844	Luminaires for Use in Hazardous (Classified) Locations	13	06/29/2012
	UL 1203	Explosionproof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations	5	11/22/2013
	UL 1309A	Cable for Mobile Installations	1	09/03/2020
	UL 1836	Outline of Investigation for Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified)	6	11/14/2022
	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
	UL 60079-28	Explosive Atmospheres — ~~Part 30-1~~: Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation	2	09/15/2017
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection	1	05/25/2021
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations	9	09/15/2017
503	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements		
	UL 823	~~Standard for~~ Electric Heaters For Use in Hazardous (Classified) Locations	9	10/20/2006
	UL 844	Luminaires for Use in Hazardous (Classified) Locations	13	06/29/2012
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations	6	11/14/2022
	UL 60079-30-1	Explosive Atmospheres — Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
	UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations	9	09/15/2017
504	UL 698A	~~Standard for~~ Industrial Control Panels Relating to Hazardous (Classified)	4	08/21/2018
	UL 913	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations	5	02/21/1997
	UL 120202	Recommendations for the Preparation, Content, and Organization of Intrinsic Safety Control Drawings	1	09/08/2014
505	FM 121303	Guide for Use of Detectors for Flammable Gases		
	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements		
	IEEE 1349	Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations		
	UL 1309A	Cable for Mobile Installations	1	09/03/2020
	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013

	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements	6	07/26/2013
	UL 60079-1	Explosive Atmospheres — Part 1: Equipment Protection by Flameproof Enclosures “d”	7	09/18/2015
	UL 60079-2	Explosive Atmospheres — Part 2: Equipment protection by pressurized enclosure	6	06/02/2017
	UL 60079-5	Explosive Gas Atmospheres — Part 5: Type of Protection — Powder Filling “q”	4	04/29/2016
	UL 60079-6	Explosive Atmospheres — Part 6: Equipment Protection by Liquid Immersion “o”	4	04/29/2016
	UL 60079-7	Explosive Atmospheres — Part 7: Equipment Protection by Increased Safety “e”	4	10/15/2008
	UL 60079-10-1	Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive Gas Atmospheres	1	TBD
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety “i”	6	02/15/2013
	UL 60079-13	Explosive Atmospheres — Part 13: Equipment Protection by Pressurized Room “p” and Artificially Ventilated Room “v”	2	06/27/2022
	UL 60079-15	Explosive Atmospheres — Part 15: Equipment Protection by Type of Protection	4	02/15/2013
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”	4	12/14/2015
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems	2	12/02/2011
	UL 60079-26	Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga	3	04/21/2017
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation	2	09/15/2017
	UL 60079-29-1	Explosive Atmospheres — Part 29-1: Gas Detectors — Performance Requirements of Detectors for Flammable Gases	2	05/31/2019
	UL 60079-29-4	Explosive Atmospheres — Part 29-4: Gas Detectors — Performance Requirements of Open Path Detectors for Flammable Gases	1	08/24/2018
	UL 60079-30-1	Explosive Atmospheres — Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection	1	05/25/2021
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements	1	06/02/2021
	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety “c”, Control of Ignition Source “b”, Liquid Immersion “k”	1	06/02/2021
	UL 121303	Guide for Use of Detectors for Flammable Gases	1	09/09/2020
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids	4	09/29/2022
506	IEEE 844.1	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — General, Testing, Marking, and Documentation Requirements		
	UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations	4	08/21/2018
	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
	UL 60079-0	Explosive Atmospheres — Part 0: Equipment — General Requirements	6	07/26/2013
	UL 60079-2	Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure	6	06/02/2017
	UL 60079-11	Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety "i"	6	02/15/2013
	UL 60079-18	Explosive Atmospheres — Part 18: Equipment Protection by Encapsulation “m”	4	12/14/2015
	UL 60079-25	Explosive Atmospheres — Part 25: Intrinsically Safe Electrical Systems	2	12/02/2011
	UL 60079-28	Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation	2	09/15/2017
	UL 60079-30-1	Explosive Atmospheres - Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
	UL 60079-31	Explosive Atmospheres — Part 31: Equipment Dust Ignition Protection by Enclosure “t”	2	06/12/2015
	UL 60079-33	Explosive Atmospheres — Part 33: Equipment Protection by Special Protection	1	05/25/2021
	UL 62784	Vacuum Cleaners and Dust Extractors Providing Equipment Protection Level Dc for the Collection of Combustible Dusts — Particular Requirements	1	TBD
	UL 80079-36	Explosive Atmospheres — Part 36: Non-Electrical Equipment for Explosive Atmospheres — Basic Method and Requirements	1	06/02/2021

	UL 80079-37	Explosive Atmospheres — Part 37: Non-Electrical Equipment for Explosive Atmospheres — Non Electrical Type of Protection Constructional Safety “c”, Control of Ignition Source “b“, Liquid Immersion “k”	1	06/02/2021
512	UL 1389	Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations	1	11/25/2019
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	13	06/29/2012
517	AAMI ES 60601-1	Medical electrical equipment — Part 1: General requirements for basic safety and essential performance		
	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 1022	Line Isolation Monitors	5	04/16/2012
	UL 1047	Isolated Power Systems Equipment	6	10/15/2015
	UL 1286	Office Furnishing Systems	6	06/29/2022
	UL 2930	Cord-and-Plug-connected Health Care Facility Outlet Assemblies	3	06/10/2020
	UL 60601-1	Medical Electrical Equipment — Part 1: General Requirements for Safety	1	04/25/2003
	UL 122701	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids	4	09/29/2022
518	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters	2	11/02/2012
	UL 2305	Exhibition Display Units, Fabrication and Installation	1	02/09/2001
	~~UL 2305A~~	~~Convention Center Cord Sets~~	~~—~~	~~—~~
520	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 334	Theater Lighting Distribution and Control Equipment	2	02/28/2022
	UL 1573	Stage and Studio Luminaires and Connector Strips	4	05/29/2003
	UL 1640	Portable Power-Distribution Equipment	4	11/14/2016
	UL 1691	Single Pole Locking-Type Separable Connectors	2	09/29/2021
522	UL 13	Power Limited Circuit Cables	4	03/18/2015
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 2250	Instrumentation Tray Cable	3	03/30/2017
525	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 817	Cord Sets and Power-Supply Cords	12	03/11/2015
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters	2	11/02/2012
	UL 1691	Single Pole Locking-Type Separable Connectors	2	09/29/2021
530	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 1479	Fire Tests of Penetration Firestops	4	06/10/2015
	UL 1573	Stage and Studio Luminaires and Connector Strips	4	05/29/2003
	UL 1680	Stage and Lighting Cables	1	11/18/2003

	UL 1691	Single Pole Locking-Type Separable Connectors	2	09/29/2021
	UL 1836	Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations	6	11/14/2022
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
540	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
545	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
	UL 5B	Strut-Type Channel Raceways and Fittings	2	04/14/2004
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits	3	04/22/2016
	UL 20	General Use Snap Switches	14	07/20/2018
	UL 209	Cellular Metal Floor Raceways and Fittings	10	12/20/2011
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 2024	Cable Routing Assemblies and Communications Raceways	5	03/25/2014
547	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 1598	Luminaires	3	09/17/2008
	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
550	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 307A	Liquid Fuel-Burning Heating Appliances for Manufactured Homes and Recreational Vehicles	9	07/24/2018
	UL 307B	Gas-Burning Heating Appliances for Manufactured Homes and Recreational	5	10/31/2006
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 817	Cord Sets and Power-Supply Cords	12	03/11/2015
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1462	Mobile Home Pipe Heating Cable	4	06/21/2006
	UL 1598	Luminaires	3	09/17/2008
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 2108	Low-Voltage Lighting Systems	2	12/07/2015
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
551	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 62	Flexible Cords and Cables	20	07/06/2018

	UL 231	Power Outlets	10	10/05/2016
	UL 234	Low Voltage Lighting Fixtures for use in Recreational Vehicles	5	01/21/2005
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 486C	Splicing Wire Connectors	7	01/26/2018
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices	2	06/28/2013
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 817	Cord Sets and Power-Supply Cords	12	03/11/2015
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 1004-4	Electric Generators	3	07/02/2018
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008M	Transfer Switch Equipment, Meter Mounted	3	08/01/2022
	UL 1008S	Solid-State Transfer Switches	1	11/15/2012
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1449	Surge Protective Devices	5	01/08/2021
	UL 1598	Luminaires	3	09/17/2008
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
	UL 60730-1	Automatic Electrical Controls; Part 1: General Requirements	4	10/19/2009
	UL 60730-2-9	Automatic Electrical Controls; Part 2: Particular Requirements for Temperature Sensing Controls	3	10/13/2010
552	SAE J1128-2015	Low Voltage Primary Cable, for Types GXL, HDT, and SXL		
	SAE J1127-2015	Low Voltage Battery Cable, for Types SGT and SGR		
	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 67	Panelboards	13	05/15/2018
	UL 231	Power Outlets	10	10/05/2016
	UL 234	Low Voltage Lighting Fixtures for Use in Recreational Vehicles	5	01/21/2005
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 430	Waste Disposers	8	09/08/2015
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 817	Cord Sets and Power-Supply Cords	12	03/11/2015
	UL 916	Energy Management Equipment	5	10/22/2015
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 1004-4	Electric Generators	3	07/02/2018
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment	6	07/16/2009
	UL 1598	Luminaires	3	09/17/2008
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019

	UL 2108	Low Voltage Lighting Systems	2	12/07/2015
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
555	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 231	Power Outlets	10	10/05/2016
	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 676	Underwater Luminaires and Submersible Junction Boxes	9	08/10/2015
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 1053	Ground-Fault Sensing and Relaying Equipment	7	08/05/2015
	UL 1650	Portable Power Cable	1	01/28/2015
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
590	UL 496	Lampholders	14	09/05/2017
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 588	Seasonal and Holiday Decorative Products	19	10/26/2015
	UL 817	Cord Sets	12	03/11/2015
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 1088	Temporary Lighting Strings	7	07/10/2015
	UL 1377	Wire used in Low Voltage Seasonal Lighting Products In Circuits With a Maximum Available Power of 15W	1	08/06/2019
600	UL 1	Flexible Metal Conduit	11	02/16/2005
	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
	UL 13	Power-Limited Circuit Cables	4	03/18/2015
	UL 48	Electric Signs	15	09/02/2011
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems	3	02/04/2015
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses	1	11/13/2015
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems	1	03/07/2016
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems	2	12/18/2015
	UL 814	Gas-Tube-Sign Cable	12	07/06/2011
	UL 879	Electric Sign Components	9	10/09/2009
	UL 879A	LED Sign and Sign Retrofit Kits	1	12/12/2012
	UL 879B	Polymeric Enclosure Systems for the Splice Between Neon Tubing Electrode Leads and GTO Cable, and the GTO Cable Leading to the Splice	1	10/22/2002
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection	1	08/22/2018
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources	3	09/28/2021
	UL 2161	Neon Transformers and Power Supplies	2	04/06/2016
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels	1	01/28/2015
	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3003	Distributed Generation Cables	1	10/26/2015
	UL 3703	Solar Trackers	1	10/08/2015
	UL 4703	Photovoltaic Wire	1	09/30/2014
	UL 6703	Connectors for Use in Photovoltaic Systems	1	08/28/2014
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings	1	03/29/2019
	UL 8703	Concentrator Photovoltaic Modules and Assemblies	3	05/02/2011

	UL 9703	Distributed Generation Wiring Harnesses	3	09/26/2018
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements For Construction	2	10/28/2022
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements For	2	10/28/2022
	UL 62109-1	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements	1	07/18/2014
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
604	UL 1	Flexible Metal Conduit	11	02/16/2005
	UL 4	Armored Cable	15	01/16/2004
	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
	UL 5B	Strut-Type Channel Raceways and Fittings	2	04/14/2004
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits	3	04/22/2016
	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 183	Manufactured Wiring Systems	4	09/22/2009
	UL 209	Cellular Metal Floor Raceways and Fittings	10	12/20/2011
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 797	Electrical Metallic Tubing — Steel	9	11/30/2007
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel	3	01/30/2014
	UL 857	Busways	13	03/25/2009
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 2024	Cable Routing Assemblies and Communications Raceways	5	03/25/2014
605	UL 962	Household and Commercial Furnishings	4	11/07/2014
	UL 1286	Office Furnishings Systems	6	06/29/2022
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 2999	Individual Commercial Office Furnishings	1	05/22/2020
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers	1	04/17/2006
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
610	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 2273	Festoon Cable	2	09/12/2019
620	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 104	Elevator Door Locking Devices and Contacts	11	02/26/2016
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 508A	Industrial Control Panels	3	04/24/2018
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1449	Surge Protective Devices	5	01/08/2021
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 2556	Wire and Cable Test Methods	5	04/30/2021
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
625	UL 62	Flexible Cords ~~A~~and Cables	20	07/06/2018
	UL 1650	Portable Power Cable	1	01/28/2015
	UL 2202	Electric Vehicle (EV) Charging System Equipment	3	12/15/2022
	UL 2231-1	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 1: General Requirements	2	09/07/2012
	UL 2231-2	Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits — Part 2: Particular Requirements for Protection Devices for Use in Charging Systems	2	09/07/2012
	UL 2251	Plugs, Receptacles and Couplers for Electrical Vehicles	4	11/20/2017

	UL 2580	Batteries for Use in Electric Vehicles	3	03/11/2020
	UL 2594	Electric Vehicle Supply Equipment	3	12/15/2022
	UL 9741	Electric Vehicle Power Export Equipment (EVPE)	2	05/21/2021
626	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 231	Power Outlets	10	10/05/2016
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 817	Cord Sets and Power-Supply Cords	12	03/11/2015
	UL 1651	Optical Fiber Cable	4	05/15/2015
	UL 1686	Pin and Sleeve Configurations	4	08/17/2012
630	UL 551	Transformer-Type Arc-Welding Machines	8	04/24/2009
640	UL 13	Power Limited Circuit Cables	4	03/18/2015
	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 813	Commercial Audio Equipment	7	12/13/1996
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1419	Professional Video and Audio Equipment	4	02/26/2016
	UL 1492	Audio-Video Products and Accessories	2	04/30/1996
	UL 1711	Amplifiers for Fire Protective Signaling Systems	4	12/28/2006
	UL 2269	Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes	3	06/03/2021
	UL 6500	Audio/Video and Musical Instrument Apparatus for Household, Commercial, and Similar General Use	2	09/30/1999
	UL 60065	Audio, Video and Similar Electronic Apparatus — Safety Requirements	8	09/30/2015
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
645	UL 38	Manual Signaling Boxes for Fire Alarm Systems	8	07/03/2008
	UL 268	Smoke Detectors for Fire Alarm Systems	6	07/02/2023
	UL 444	Communications Cables	5	01/20/2017
	UL 464	Audible Signaling Devices for Fire Alarm and Signaling Systems, Including	10	01/28/2016
	UL 497B	Protectors for Data Communications and Fire Alarm Circuits	4	06/14/2004
	UL 833	Control Units and Accessories for Fire Alarm Systems	1	03/30/2021
	UL 864	Control Units and Accessories for Fire Alarm Systems	10	12/01/2014
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits	4	01/22/2015
	UL 1425	Cables for Non-Power-Limited Fire-Alarm Circuits	3	01/26/2015
	UL 1449	Surge Protective Devices	5	01/08/2021
	UL 1480	Speakers for Fire Alarm and Signaling Systems, Including Accessories	6	01/28/2016
	UL 1638	Visible Signaling Devices for Fire Alarm and Signaling Systems, Including	5	01/28/2016
	UL 1651	Optical Fiber Cable	4	05/15/2015
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 1690	Data-Processing Cable	4	07/07/2015
	UL 1778	Uninterruptible Power Systems	5	06/13/2014
	UL 2024	Cable Routing Assemblies and Communications Raceways	5	03/25/2014
	UL 60950-1	Information Technology Equipment Safety — Part 1: General Requirements	2	03/27/2007
	UL 60950-21	Information Technology Equipment Safety — Part 21: Remote Power Feeding	1	11/10/2003
	UL 60950-22	Information Technology Equipment Safety — Part 22: Equipment to be Installed Outdoors	2	03/31/2017
	UL 60950-23	Information Technology Equipment Safety — Part 23: Large Data Storage	1	04/23/2007
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
646	UL 10C	Positive Pressure Fire Tests of Door Assemblies	3	06/09/2016
	UL 62	Flexible Cords and Cables	20	07/06/2018

	UL 67	Panelboards	13	05/15/2018
	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 305	Panic Hardware	6	07/12/2012
	UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers	7	11/23/2020
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 508A	Industrial Control Panels	3	04/24/2018
	UL 845	Motor Control Centers	6	06/28/2021
	UL 869A	Reference Standard for Service Equipment	4	11/10/2006
	UL 891	Switchboards	12	07/19/2019
	UL 924	Emergency Lighting and Power Equipment	10	05/09/2016
	UL 977	Fused Power-Circuit Devices	5	04/30/2012
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
	UL 1008M	Meter-Mounted Transfer Switches	3	08/01/2022
	UL 1008S	Solid-State Transfer Switches	1	11/15/2012
	UL 1062	Unit Substations	3	01/29/1997
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1429	Pullout Switches	4	04/18/2000
	UL 1449	Surge Protective Devices	5	01/08/2021
	UL 1655	Community-Antenna Television Cables	2	04/21/2009
	UL 1989	Standby Batteries	5	10/02/2013
	UL 2755	Modular Data Centers	2	07/18/2018
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
647	UL 1598	Luminaires	3	09/17/2008
650	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords	4	10/31/2001
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
670	ANSI/CSA-C22.2 No. 19085-1	Woodworking machines — Safety — Part 1: Common requirements		
	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy	1	06/08/2012
675	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables	10	12/10/2018
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords	4	10/31/2001
680	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 20	General Use Snap-Switches	14	07/20/2018
	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 379	Power Units for Fountain, Swimming Pool, and Spa Luminaires	1	06/19/2013
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 676	Underwater Luminaires and Submersible Junction Boxes	9	08/10/2015
	UL 676A	Potting Compounds for Swimming Pool, Fountain, and Spa Equipment	3	08/06/2003
	UL 943	Ground-Fault Circuit-Interrupters	5	05/17/2016
	UL 943C	Special Purpose Ground-Fault Circuit-Interrupters	2	11/02/2012
	UL 1004-10	Pool Pump Motors	1	02/28/2020
	UL 1081	Swimming Pool Pumps, Filters, and Chlorinators	7	08/09/2016
	UL 1241	Junction Boxes for Swimming Pool Luminaires	7	06/11/2003

	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1261	Electric Water Heaters for Pools and Tubs	6	09/02/2016
	UL 1563	Electric Spas, Equipment Assemblies, and Associated Equipment	6	07/16/2009
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit	6	01/30/2019
	UL 1795	Hydromassage Bathtubs	5	09/02/2016
	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	1	07/30/2009
	UL 2452	Electric Swimming Pool and Spa Cover Operators	1	04/21/2006
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
	UL 2515A	Supplemental Requirements for Extra Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	1	11/21/2011
	UL 2995	Lifts for Swimming Pools and Spas	1	12/12/2016
	UL 60335-2-1000	Household and Similar Electrical Appliances: Particular Requirements for Electrically Powered Pool Lifts	1	09/29/2017
682	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 1650	Portable Power Cable	1	01/28/2015
	UL 1838	Low Voltage Landscape Lighting Systems	3	01/13/2003
690	UL 98B	Enclosed and Dead-Front Switches for Use in Photovoltaic Systems	3	02/04/2015
	UL 248-19	Low-Voltage Fuses — Part 19: Photovoltaic Fuses	1	11/13/2015
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 489B	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures For Use With Photovoltaic (PV) Systems	1	03/07/2016
	UL 508I	Disconnect Switches Intended for Use in Photovoltaic Systems	2	12/18/2015
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 1699B	Photovoltaic (PV) DC Arc-Fault Circuit Protection	1	08/22/2018
	UL 1703	Flat-Plate Photovoltaic Modules and Panels	3	03/15/2002
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources	3	09/28/2021
	UL 2703	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels	1	01/28/2015
	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3003	Distributed Generation Cables	1	10/26/2015
	~~UL 3005~~	~~Distributed Energy Resource Management Systems~~	—	—
	UL 3703	Solar Trackers	1	10/08/2015
	UL 3730	Photovoltaic Junction Boxes	1	11/11/2014
	UL 3741	Photovoltaic Hazard Control	1	12/08/2020
	UL 4703	Photovoltaic Wire	1	09/30/2014
	UL 6703	Connectors for Use in Photovoltaic Systems	1	08/28/2014
	UL 7103	Investigation for Building-Integrated Photovoltaic Roof Coverings	1	03/29/2019
	UL 8703	Concentrator Photovoltaic Modules and Assemblies	3	05/02/2011
	UL 8801	Photovoltaic Luminaire Systems	1	06/15/2022
	UL 9703	Distributed Generation Wiring Harnesses	3	09/26/2018
	UL 61730-1	Photovoltaic (PV) Module Safety Qualification — Part 1: Requirements for Construction	2	10/28/2022
	UL 61730-2	Photovoltaic (PV) Module Safety Qualification — Part 2: Requirements for	2	10/28/2022
	UL 62109-1	Power Converters for Use in Photovoltaic Power Systems — Part 1: General Requirements	1	07/18/2014
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
692	UL 2262	Fuel Cell Modules for Use in Portable and Stationary Equipment	2	08/20/2012
	UL 2262A	Borohydride Fuel Cartridges with Integral Fuel Processing for Use with Portable Fuel Cell Power Systems or Similar Equipment	2	12/20/2011
	UL 2265	Fuel Cell Power Units and Fuel Storage Containers for Portable Devices	1	07/05/2012
	UL 2265A	Hand-held or Hand-Transportable Fuel Cell Power Units with Disposable Methanol Fuel Cartridges for use in Original Equipment Manufacturer's Information Technology Equipment	2	04/27/2018

	UL 2265C	Hand-Held or Hand-Transportable Alkaline (Direct Borohydride) Fuel Cell Power Units and Borohydride Fuel Cartridges For Use With Consumer Electronics or Information Technology Equipment	1	08/02/2006
	UL 2266	Electromagnetic Compatibility, Electrical Safety, and Physical Protection of Stationary and Portable Fuel Cell Power Systems for Use with Commercial Network Telecommunications Equipment	1	06/08/2007
	UL 2267	Fuel Cell Power Systems for Installation in Industrial Electric Trucks	3	03/26/2020
694	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 489C	Molded-Case Circuit Breakers and Molded-Case Switches for Use with Wind	1	04/06/2012
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources	3	09/28/2021
	UL 2227	Flexible Motor Supply Cable and Wind Turbine Tray Cable	2	02/16/2007
	UL 2736	Single Pole Separable Interconnecting Cable Connectors for Use with Wind Turbine Generating Systems	1	05/28/2010
	UL 4143	Wind Turbine Generator — Life Time Extension (LTE)	1	02/09/2018
	UL 6141	Wind Turbines Permitting Entry of Personnel	1	05/20/2016
	UL 6142	Small Wind Turbine Generating Systems ~~— Small~~	1	11/30/2012
695	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 218	Fire Pump Controllers	3	09/16/2015
	UL 448	Centrifugal Stationary Pumps for Fire-Protection Service	12	03/30/2020
	UL 448B	Residential Fire Pumps Intended for One- and Two-Family Dwellings and Manufactured Homes	2	01/04/2023
	UL 448C	Stationary, Rotary-Type, Positive-Displacement Pumps for Fire Protection Service	2	01/04/2023
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings	8	10/25/2011
	UL 1004-5	Fire Pump Motors	2	05/09/2014
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 1724	Fire Tests for Electrical Circuit Protective Systems	3	12/07/2006
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019
700	UL 924	Emergency Lighting and Power Equipment	10	05/09/2016
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
	UL 1449	Surge Protective Devices	5	01/08/2021
	UL 1724	Fire Tests for Electrical Circuit Protective Systems	3	12/07/2006
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
701	UL 924	Emergency Lighting and Power Equipment	10	05/09/2016
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
702	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
	UL 1008M	Meter-Mounted Transfer Switches	3	08/01/2022
	UL 1008S	Solid-State Transfer Switches	1	11/15/2012
705	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 98	Enclosed and Dead-Front Switches	14	02/12/2016
	UL 486D	Sealed Wire Connector Systems	6	06/19/2015
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1429	Pullout Switches	4	04/18/2000

	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources	3	09/28/2021
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
	UL 3003	Distributed Generation Cables	1	10/26/2015
	UL 6141	Wind Turbines Permitting Entry of Personnel	1	05/20/2016
	UL 6142	Small Wind Turbine Systems	1	11/20/2012
	UL 9540	Energy Storage Systems and Equipment	2	02/27/2020
	UL 62109-2	Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters	1	TBD
706	UL 248-2	Low-Voltage Fuses — Part 2: Class C Fuses	2	08/01/2000
	UL 248-3	Low-Voltage Fuses — Part 3: Class CA and CB Fuses	2	08/01/2000
	UL 248-4	Low-Voltage Fuses — Part 4: Class CC Fuses	2	08/01/2000
	UL 248-5	Low-Voltage Fuses — Part 5: Class G Fuses	2	08/01/2000
	UL 248-6	Low-Voltage Fuses — Part 6: Class H Non-Renewable Fuses	2	08/01/2000
	UL 248-8	Low-Voltage Fuses — Part 8: Class J Fuses	3	05/13/2011
	UL 248-9	Low-Voltage Fuses — Part 9: Class K Fuses	2	08/01/2000
	UL 248-10	Low-Voltage Fuses — Part 10: Class L Fuses	3	05/13/2011
	UL 248-12	Low-Voltage Fuses — Part 12: Class R Fuses	3	05/13/2011
	UL 248-15	Low-Voltage Fuses — Part 15: Class T Fuses	3	03/09/2018
	UL 248-17	Low-Voltage Fuses — Part 17: Class CF Fuses	5	09/13/2018
	UL 248-18	Low-Voltage Fuses — Part 18: Class CD Fuses	1	03/31/2022
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 489H	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures, for Use with Direct Current (DC) Microgrids	1	11/14/2017
	UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	5	08/08/2022
	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources	3	09/28/2021
	UL 9540	Energy Storage Systems and Equipment	2	02/27/2020
708	UL 1	Flexible Metal Conduit	11	02/16/2005
	UL 4	Armored Cable	15	01/16/2004
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 360	Liquid-Tight Flexible Metal Conduit	7	01/17/2013
	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables	10	12/10/2018
	UL 497A	Secondary Protectors for Communications Circuits	3	03/20/2001
	UL 1008	Transfer Switch Equipment	8	12/22/2014
	UL 1008A	Transfer Switch Equipment, Over 1000 Volts	2	09/05/2017
	UL 1008M	Meter-Mounted Transfer Switches	3	08/01/2022
	UL 1008S	Solid-State Transfer Switches	1	11/15/2012
	UL 1569	Metal-Clad Cables	5	05/04/2018
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
710	UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources	3	09/28/2021
	UL 2200	Stationary Engine Generator Assemblies	2	06/01/2012
	UL 8801	Photovoltaic Luminaire Systems	1	06/15/2022
	UL 9540	Energy Storage Systems and Equipment	2	02/27/2020
	UL 62109-1	Power Converters for use in Photovoltaic Power Systems — Part 1: General Requirements	1	07/18/2014
	UL 62109-2	Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters	1	TBD
722	UL 13	~~Standard for~~ Power-Limited Circuit Cables	4	03/18/2015
	UL 444	~~Standard for Safety for~~ Communications Cables	5	01/20/2017
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits	4	01/22/2015
	UL 1651	Optical Fiber Cable	4	05/15/2015

	UL 1666	Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts	5	02/16/2007
	UL 1685	~~Standard for Safety for~~ Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 1724	Fire Tests for Electrical Circuit Protective Systems	3	12/07/2006
	UL 2024	Commercial Closed-Circuit Television Equipment ~~Standard for Safety for Communications Cables~~	5	06/28/2019
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
	UL 2556	~~Standard for~~ Wire and Cable Test Methods	5	04/30/2021
725	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers	1	04/17/2006
	UL 9990	Information and Communication Technology (ICT) Power Cables	4	09/27/2021
	UL 61010-2-201	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-201: Particular Requirements for Control Equipment	2	05/14/2018
	UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy	1	06/08/2012
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
726	UL 1400-1	Fault-Managed Power Systems — Part 1 General Requirements	1	12/19/2022
	UL 1400-2	Fault-Managed Power Systems — Part 2 Requirements for Cables	1	01/06/2022
	UL 1666	Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts	5	02/16/2007
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 2556	Wire and Cable Test Methods	5	04/30/2021
728	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 5A	Nonmetallic Surface Raceways and Fittings	4	06/26/2015
	UL 5B	Strut-Type Channel Raceways and Fittings	2	04/14/2004
	UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits	3	04/22/2016
	UL 209	Cellular Metal Floor Raceways and Fittings	10	12/20/2011
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers	4	04/08/2014
	UL 568	Nonmetallic Cable Tray Systems	1	10/15/2002
	UL 884	Underfloor Raceways and Fittings	13	05/20/2016
	UL 1724	Fire Tests for Electrical Circuit Protective Systems	3	12/07/2006
	UL 2024	Cable Routing Assemblies and Communications Raceways	5	03/25/2014
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
760	UL 268	Smoke Detectors for Fire Alarm ~~Signaling~~ Systems	6	07/02/2023
	UL 268A	Smoke Detectors for Duct Application	4	12/11/2008
	UL 486C	Splicing Wire Connectors	7	01/26/2018
	UL 497B	Protectors for Data Communications and Fire Alarm Circuits	4	06/14/2004
	UL 1424	Cables for Power-Limited Fire-Alarm Circuits	4	01/22/2015
	UL 1425	Cables for Non-Power-Limited Fire-Alarm Circuits	3	01/26/2015
	UL 1480	Speakers for Fire Alarm and Signaling Systems, Including Accessories	6	01/28/2016
	UL 1666	Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts	5	02/16/2007
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
	UL 60730-2-14	Automatic Electrical Controls; Part 2: Particular Requirements for Electric	2	02/27/2013
770	UL 467	Grounding and Bonding Equipment	11	04/29/2022

	UL 568	Nonmetallic Cable Tray Systems	1	10/15/2002
	UL 1651	Optical Fiber Cable	4	05/15/2015
	UL 2024	Optical Fiber and Communication Cable Raceway	5	03/25/2014
	UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables	2	08/28/2017
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
800	UL 444	Communications Cables	5	01/20/2017
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 489A	Circuit Breakers for Use in Communication Equipment	1	10/15/2008
	UL 497	Protectors for Paired-Conductor Communications Circuits	7	04/25/2001
	UL 497A	Secondary Protectors for Communications Circuits	3	03/20/2001
	UL 497C	Protectors for Coaxial Communications Circuits	2	08/03/2001
	UL 497E	Protectors for Antenna Lead-In Conductors	4	01/25/2011
	UL 523	Telephone Service Drop Wire	2	11/27/2006
	UL 568	Nonmetallic Cable Tray Systems	1	10/15/2002
	UL 723	Test for Surface Burning Characteristics of Building Materials	11	04/19/2018
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords	4	10/31/2001
	UL 1666	Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts	5	02/16/2007
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 1863	Communication Circuit Accessories	4	05/14/2004
	UL 2024	Cable Routing Assemblies and Communications Raceways	5	03/25/2014
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
805	UL 444	Communications Cables	5	01/20/2017
	UL 497	Protectors for Paired-Conductor Communications Circuits	7	04/25/2001
	UL 497A	Secondary Protectors for Communications Circuits	3	03/20/2001
	UL 497C	Protectors for Coaxial Communications Circuits	2	08/03/2001
	UL 497E	Protectors for Antenna Lead-In Conductors	4	01/25/2011
	UL 523	Telephone Service Drop Wire	2	11/27/2006
	UL 719	Nonmetallic-Sheathed Cables	13	09/08/2015
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords	4	10/31/2001
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015
	UL 1863	Communication Circuit Accessories	4	05/14/2004
	UL 2043	Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces	4	10/02/2013
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation	3	09/24/2021
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
810	UL 150	Antenna Rotators	4	11/09/2004
	UL 452	Antenna-Discharge Units	7	11/02/2006
	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 497E	Protectors for Antenna Lead-In Conductors	4	01/25/2011
820	UL 444	Communications Cables	5	01/20/2017
	UL 497E	Protectors for Antenna Lead-In Conductors	4	01/25/2011
	UL 1655	Community-Antenna Television Cables	2	04/21/2009
830	UL 444	Communications Cables	5	01/20/2017
	UL 497A	Secondary Protectors for Communications Circuits	3	03/20/2001
	UL 497C	Protectors for Coaxial Communications Circuits	2	08/03/2001
	UL 497E	Protectors for Antenna Lead-In Conductors	4	01/25/2011
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
840	UL 444	Communications Cables	5	01/20/2017

	UL 467	Grounding and Bonding Equipment	11	04/29/2022
	UL 498A	Current Taps and Adapters	2	01/23/2008
	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1651	Optical Fiber Cable	4	05/15/2015
	UL 1863	Communication Circuit Accessories	4	05/14/2004
	UL 2024	Cable Routing Assemblies and Communications Raceways	5	03/25/2014
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
Tables 11(A) and 11(B)	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1434	Thermistor-Type Devices	1	04/03/1998
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers	1	04/17/2006
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012
Tables 12(A) and 12(B)	UL 1310	Class 2 Power Units	7	03/09/2018
	UL 1434	Thermistor-Type Devices	1	04/03/1998
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers	1	04/17/2006
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements	1	02/17/2012

Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title	Edition	Publication Date
110	UL 969	Marking and Labeling Systems	5	05/30/2017
	UL 9691	Recommended Practice for Nameplates for Use in Electrical Installations	1	03/22/2021
300	UL 635	Insulating Bushings	3	03/08/2012
314	UL 514~~C~~B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
320	UL 514A	Metallic Outlet Boxes	11	02/01/2013
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
322	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
324	UL 5	Surface Metal Raceways and Fittings	15	05/24/2016
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
330	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
332	UL 1565	Positioning Devices	6	07/29/2022
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
334	UL 6	Electrical Rigid Metal Conduit — Steel	15	11/28/2022
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	2	10/31/2008
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 651	Schedule 40 and 80 Rigid PVC Conduit	8	10/25/2011
	UL 797	Electrical Metallic Tubing — Steel	9	11/30/2007
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel	3	01/30/2014
	UL 1242	Electrical Intermediate Metal Conduit — Steel	4	02/16/2006
	UL 1565	Positioning Devices	6	07/29/2022
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	1	07/30/2009
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings	2	02/05/2019

	UL 2515A	Supplemental Requirements for Extra Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings~~.~~	1	11/21/2011
335	UL 2250	Instrumentation Tray Cable	3	03/30/2017
337	UL 1565	Positioning Devices	6	07/29/2022
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
340	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables	10	12/10/2018
342	UL 635	Insulating Bushings	3	03/08/2012
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
344	UL 635	Insulating Bushings	3	03/08/2012
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
348	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
350	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
352	UL 635	Insulating Bushings	3	03/08/2012
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
353	UL 635	Insulating Bushings	3	03/08/2012
355	UL 635	Insulating Bushings	3	03/08/2012
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
356	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
358	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
362	UL 2239	Hardware for the Support of Conduit, Tubing and Cable	2	02/20/2015
368	UL 857	Busways	13	03/25/2009
392	UL 568	Nonmetallic Cable Tray Systems	1	10/15/2002
400	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 498	Attachment Plugs and Receptacles	16	04/28/2017
	UL 498B	Receptacles with Integral Switching Means	1	08/19/2022
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts	1	07/29/2020
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection	1	07/29/2020
	UL 514B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
	UL 817	Cord Sets and Power-Supply Cords	12	03/11/2015
	UL 1650	Portable Power Cable	1	01/28/2015
	UL 1680	Stage and Lighting Cables	1	11/18/2003
402	UL 66	Fixture Wire	3	01/18/2023
408	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
424	UL 834	Heating, Water Supply, and Power Boilers — Electric	5	04/13/2004
	UL 1693	Electric Radiant Heating Panels and Heating Panel Sets	3	09/13/2010
	UL 1995	Heating and Cooling Equipment	5	07/31/2015
	UL 1996	Electric Duct Heaters	4	08/31/2009
	UL 60335-1	Safety of Household and Similar Electrical Appliances, Part 1: General	4	03/05/2004
	UL 60335-2-40	Household and Similar Electrical Appliances~~,~~ — Safety — Part 2–40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	3	11/01/2019
425	UL 834	Heating, Water Supply, and Power Boilers — Electric	5	04/13/2004
426	UL 1588	Roof and Gutter De-Icing Cable Units	4	05/24/2002
427	UL 515	Electrical Resistance Trace Heating for Commercial Applications	2	07/17/2015
	UL 1462	Mobile Home Pipe Heating Cable	4	06/21/2006
	UL 2049	Residential Pipe Heating Cable	4	06/21/2006
430	UL 248-13	Low Voltage Fuses — Part 13: Semiconductor Fuses	3	03/31/2022
445	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
450	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations	13	10/16/2015
	UL 50E	Enclosures for Electrical Equipment, Environmental Considerations	3	10/15/2020
	UL 248-1	Low-Voltage Fuses — Part 1: General Requirements	4	10/24/2022
	UL 248-2	Low-Voltage Fuses — Part 2: Class C Fuses	2	08/01/2000

	UL 248-3	Low-Voltage Fuses — Part 3: Class CA and CB Fuses	2	08/01/2000
	UL 248-4	Low-Voltage Fuses — Part 4: Class CC Fuses	2	08/01/2000
	UL 248-5	Low-Voltage Fuses — Part 5: Class G Fuses	2	08/01/2000
	UL 248-8	Low-Voltage Fuses — Part 8: Class J Fuses	3	05/13/2011
	UL 248-9	Low-Voltage Fuses — Part 9: Class K Fuses	2	08/01/2000
	UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker	13	10/24/2016
	UL 1561	Dry-Type General Purpose and Power Transformers	4	03/02/2011
	UL 5085-2	Low Voltage Transformers — Part 2: General Purpose Transformers	2	08/16/2021
460	UL 810	Capacitors	6	10/29/2019
	UL 1283	Electromagnetic Interference Filters	7	05/17/2017
	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	2	07/11/2014
470	UL 508	Industrial Control Equipment	18	03/30/2018
	UL 1283	Electromagnetic Interference Filters	7	05/17/2017
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		
	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	2	10/15/2018
	UL 120002	Certificate Standard for AEx Equipment for Hazardous (Classified) Locations	2	03/03/2022
	UL 120101	Definitions and Information Pertaining to Electrical Equipment in Hazardous (Classified) Locations	1	12/03/2019
	UL 121303	Guide for Combustible Gas Detection as a Method of Protection	1	09/09/2020
	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	2	01/14/2021
501	UL 62	Flexible Cord and Cable	20	07/06/2018
	UL 504	Mineral-Insulated, Metal-Sheathed Cable	2	09/22/2022
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	2	01/14/2021
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	2	01/14/2021
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		
	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	1	06/02/2020
	UL 120101	Definitions and Information Pertaining to Electrical Equipment in Hazardous (Classified) Locations	1	12/03/2019
	UL 121303	Guide for Use of Detectors for Flammable Gases	1	09/09/2020

	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	2	01/14/2021
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		
	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		
	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	2	01/14/2021
511	NFPA 30A	Code for Motor Fuel Dispensing Facilities and Repair Garages		
	NFPA 88A	Standard for Parking Structures		
512	ICC IFC	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		
	NFPA 409	Standard on Aircraft Hangars		
514	NFPA 2	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	15	01/16/2004
	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 66	Fixture Wire	3	01/18/2023
	UL 504	Mineral Insulated Wire	2	09/22/2022
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 1569	Metal-Clad Cable	5	05/04/2018
625	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
630	UL 1276	Welding Cable	2	10/01/2015
650	UL 1651	Optical Fiber Cable	4	05/15/2015

660	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 817	Cord Sets and Power Supply Cords	12	03/11/2015
668	UL 4	Armored Cable	15	01/16/2004
	UL 62	Flexible Cords and Cables	20	07/06/2018
670	UL 2011	Machinery	7	11/10/2022
675	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 1263	Irrigation Cable	6	01/16/2020
690	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
691	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
692	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
694	UL 44	Thermoset-Insulated Wires and Cables	19	01/09/2018
	UL 62	Flexible Cords and Cables	20	07/06/2018
	UL 83	Thermoplastic-Insulated Wires and Cables	16	07/28/2017
	UL 83A	Fluoropolymer Insulated Wire	1	02/01/2016
	UL 1063	Machine-Tool Wires and Cables	8	07/13/2017
	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
700	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
701	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
702	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
705	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD
710	UL 3001	Distributed Energy Generation and Storage Systems	1	03/17/2023
	UL 3010	Single Site Energy Systems	1	TBD

Title Corrections: Tables A.1(a) and A.1(b)

Article	Standard Number	Standard Title	Edition	Date
110	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
210	UL 943	Ground-Fault Circuit Interrupters	5	05/17/2016
210	UL 1029	High-Intensity-Discharge Lamp Ballasts	5	05/25/1994
210	UL 1699A	Outlet Branch Circuit ~~AFCIs~~ Arc-Fault Circuit-Interrupters	2	03/17/2010
300	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
312	UL 61010-1~~ and UL 61010-2-030~~	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements ~~Part 2-030: Particular Requirements for Testing and Measuring Circuits~~	3	05/11/2012
312	UL 61010-2-030	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-030: Particular Requirements for Testing and Measuring Circuits	2	12/21/2018
348	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
350	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
356	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
362	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
376	UL 870	Wireways, Auxiliary Gutters, and Associated Fittings	9	03/03/2016
392	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
422	UL 515	Electrical Resistance Trace Heating for Commercial Applications	2	07/17/2015
430	UL 1569	Metal-Clad Cable	5	05/04/2018
500	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
500	UL 122701	Requirements for Process Sealing Between Electrical Systems and ~~Potentially~~ Flammable or Combustible Process Fluids	4	09/29/2022
501	UL 823	~~Standard for~~ Electric Heaters For Use in Hazardous (Classified) Locations	9	10/20/2006
501	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
501	UL 60079-30-1	Explosive Atmospheres — Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
501	UL 122701	Requirements for Process Sealing Between Electrical Systems and ~~Potentially~~ Flammable or Combustible Process Fluids	4	09/29/2022
502	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
502	UL 60079-28	Explosive Atmospheres — ~~Part 30-1~~: Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation	2	09/15/2017
503	UL 823	~~Standard for~~ Electric Heaters For Use in Hazardous (Classified) Locations	9	10/20/2006
504	UL 698A	~~Standard for~~ Industrial Control Panels Relating to Hazardous (Classified) Locations	4	08/21/2018
505	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
506	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
506	UL 60079-30-1	Explosive Atmospheres - Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements	1	05/05/2017
547	UL 2225	Cable and Cable-Fittings for Use in Hazardous (Classified) Locations	4	09/30/2013
625	UL 62	Flexible Cords ~~A~~and Cables	20	07/06/2018
690	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
694	UL 6142	Small Wind Turbine Generating Systems~~ — Small~~	1	11/30/2012
722	UL 13	~~Standard for~~ Power-Limited Circuit Cables	4	03/18/2015
722	UL 444	~~Standard for Safety for~~ Communications Cables	5	01/20/2017
722	UL 1666	Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts	5	02/16/2007
722	UL 1685	~~Standard for Safety for~~ Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables	4	07/07/2015

722	UL 2024	Commercial Closed-Circuit Television Equipment ~~Standard for Safety for Communications Cables~~	5	06/28/2019
722	UL 2556	~~Standard for~~ Wire and Cable Test Methods	5	04/30/2021
760	UL 268	Smoke Detectors for Fire Alarm ~~Signaling~~ Systems	6	07/02/2023
770	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
800	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations	3	09/24/2021
314	UL 514~~C~~B	Conduit, Tubing, and Cable Fittings	6	07/13/2012
334	UL 2515A	Supplemental Requirements for Extra Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings~~.~~	1	11/21/2011
424	UL 60335-2-40	Household and Similar Electrical Appliances~~,~~ — Safety — Part 2–40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	3	11/01/2019
620	UL 1569	Metal-Clad Cable	5	05/04/2018

Public Input No. 3338-NFPA 70-2023 [Annex J]

Informative Annex J ADA Standards for Accessible Design

This informative annex is not a part of the requirements of this NFPA document, but is included for informational purposes only.

The provisions cited in Informative Annex J are intended to assist the users of the *Code* in properly considering the various electrical design constraints of other building systems and are part of the 2010 ADA Standards for Accessible Design. They are the same provisions as those found in ANSI/ICC A117.1-2009, *Accessible and Usable Buildings and Facilities*.

J.1 *Protruding Objects.*

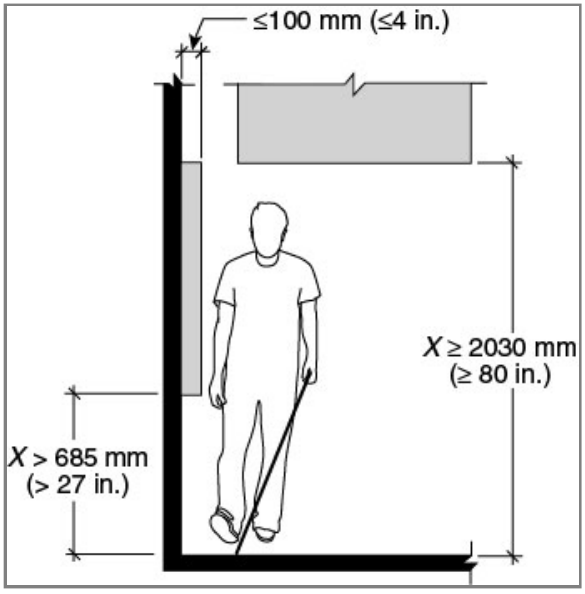
Protruding objects shall comply with Section J.2.

J.2 *Protrusion Limits.*

Objects with leading edges more than 685 mm (27 in.) and not more than 2030 mm (80 in.) above the finish floor or ground shall protrude a maximum of 100 mm (4 in.) horizontally into the circulation path. *(See Figure J.2.)*

Exception: Handrails shall be permitted to protrude 115 mm (4½ in.) maximum.

Figure J.2 Limits of Protruding Objects.

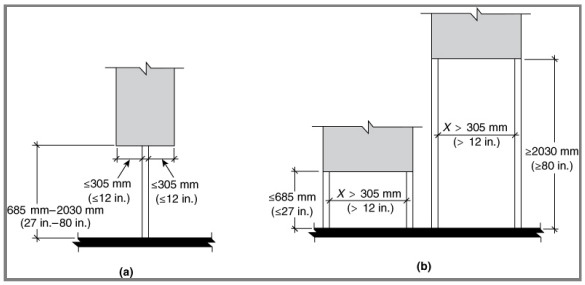


J.3 *Post-Mounted Objects.*

Freestanding objects mounted on posts or pylons shall overhang circulation paths 305 mm (12 in.) maximum where located 685 mm (27 in.) minimum and 2030 mm (80 in.) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons, and the clear distance between the posts or pylons is greater than 305 mm (12 in.), the lowest edge of such sign or obstruction shall be 685 mm (27 in.) maximum or 2030 mm (80 in.) minimum above the finish floor or ground. *(See Figure J.3.)*

Exception: The sloping portions of handrails serving stairs and ramps shall not be required to comply with Section J.3.

Figure J.3 Post-Mounted Protruding Objects.

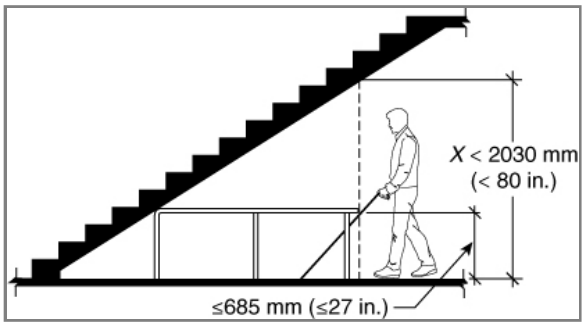


J.4 *Vertical Clearance.*

Vertical clearance shall be 2030 mm (80 in.) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 2030 mm (80 in.) high. The leading edge of such guardrail or barrier shall be located 685 mm (27 in.) maximum above the finish floor or ground. *(See Figure J.4.)*

Exception: Door closers and door stops shall be permitted to be 1980 mm (78 in.) minimum above the finish floor or ground.

Figure J.4 Vertical Clearance.



J.5 *Required Clear Width.*

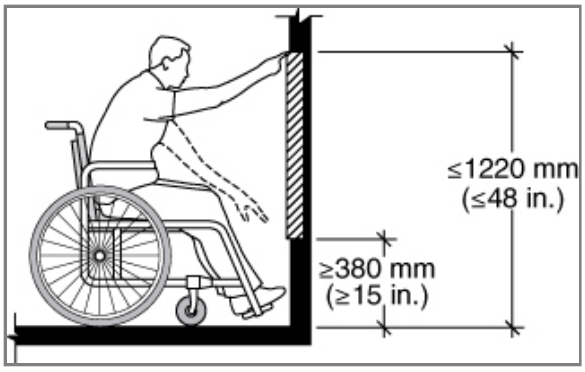
Protruding objects shall not reduce the clear width required for accessible routes.

J.6 *Forward Reach.*

J.6.1 Unobstructed.

Where a forward reach is unobstructed, the high forward reach shall be 1220 mm (48 in.) maximum, and the low forward reach shall be 380 mm (15 in.) minimum above the finish floor or ground. *(See Figure J.6.1.)*

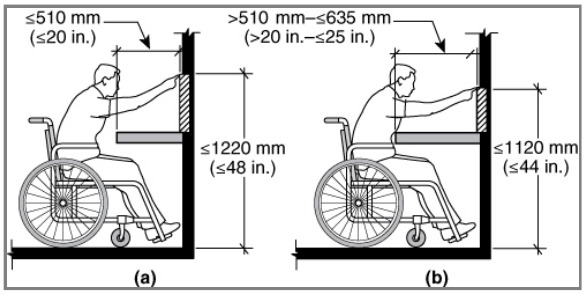
Figure J.6.1 Unobstructed Forward Reach.



J.6.2 Obstructed High Reach.

Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 1220 mm (48 in.) maximum where the reach depth is 510 mm (20 in.) maximum. Where the reach depth exceeds 510 mm (20 in.), the high forward reach shall be 1120 mm (44 in.) maximum, and the reach depth shall be 635 mm (25 in.) maximum. *(See Figure J.6.2.)*

Figure J.6.2 Obstructed High Forward Reach.



J.7 *Side Reach.*

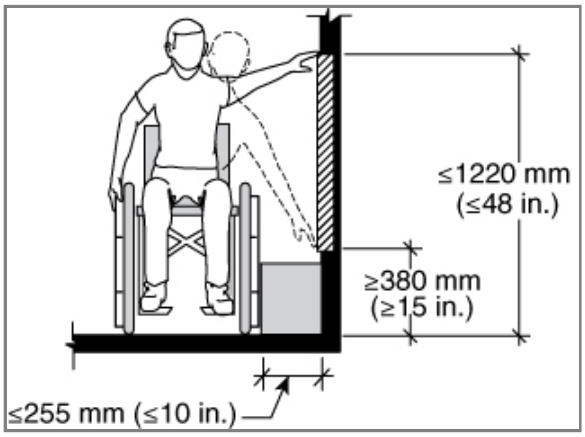
J.7.1 *Unobstructed.*

Where a clear floor or ground space allows a parallel approach to an element, and the side reach is unobstructed, the high side reach shall be 1220 mm (48 in.) maximum, and the low side reach shall be 380 mm (15 in.) minimum above the finish floor or ground. *(See Figure J.7.1.)*

Exception No. 1: An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 255 mm (10 in.) maximum.

Exception No. 2: Operable parts of fuel dispensers shall be permitted to be 1370 mm (54 in.) maximum, measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

Figure J.7.1 Unobstructed Side Reach.



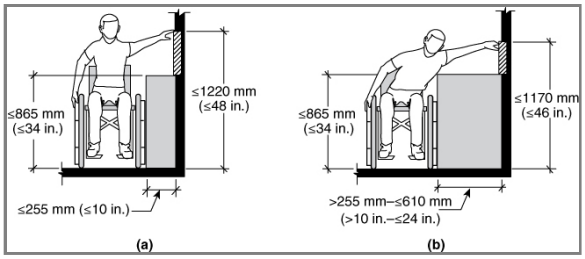
J.7.2 *Obstructed High Reach.*

Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 865 mm (34 in.) maximum, and the depth of the obstruction shall be 610 mm (24 in.) maximum. The high side reach shall be 1220 mm (48 in.) maximum for a reach depth of 255 mm (10 in.) maximum. Where the reach depth exceeds 255 mm (10 in.), the high side reach shall be 1170 mm (46 in.) maximum for a reach depth of 610 mm (24 in.) maximum. *(See Figure J.7.2.)*

Exception No. 1: The top of washing machines and clothes dryers shall be permitted to be 915 mm (36 in.) maximum above the finish floor.

Exception No. 2: Operable parts of fuel dispensers shall be permitted to be 1370 mm (54 in.) maximum, measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

Figure J.7.2 Obstructed High Side Reach.



Additional Proposed Changes

File Name	Description	Approved
NFPA_70_NEC_Annex_J_for_DARAC_Consideration.docx		

Statement of Problem and Substantiation for Public Input

We urge the committee to revise this Annex to reference or reproduce (with permission) the accessibility requirements of the ICC A117.1-2017 Accessible and Usable Buildings and Facilities or, if available prior to publication of the next edition of the NEC, the ICC A117.1-2023 currently in development. Alternatively, the committee could delete this Annex in its entirety.

Currently, the differences between the 2010 Americans with Disabilities Act (ADA) Standards which are reproduced in the Annex and the ICC A117.1-2017 are minimal. However, the information in the current Annex is dated and will not satisfy building codes referencing the 2017 and 2023 Editions of the ICC A117.1. For example, Section J3 permits a 12-inch protrusion on each side of a post or pylon while ICC A117.1-2017 permits a protrusion of 4 inches maximum.

TIA No. 1679 raised concerns regarding inconsistencies in terminology and the need for coordination of the 2023 Edition of the NEC and the ICC A117.1. The TIA failed and an appeal was submitted (see Standards Council Final Decision

D#22-15). Although the appeal did not result in the desired actions, the Council requested that the appellant work with DARC to resolve the matter. Several DARAC members are also ICC A117 Committee members. DARAC's recommendation to revise this Annex to reflect accessibility requirements referenced by ICC's International Building Code (IBC) and most adopted buildings codes in the U.S. is the first step in this process.
Secondly, it is likely that 2023 Edition of the ICC A117.1 will contain revisions in terminology and its technical provisions to resolve conflicts between the 2023 NEC and the ICC A117.1 regarding the location of accessible receptacle outlets. The NEC Annex should highlight these revisions when they are available – hopefully prior to publication of the next edition. Designers and installers will need to be familiar with both the NEC and ICC A117.1 requirements to successfully comply. The older criteria in the 2010 ADA Standards will not suffice.
The ICC A117.1 is referenced in building codes across the nation. The intent of the Standard is to meet or exceed the accessibility requirements of the ADA and the Fair Housing Act. The ADA Standards are infrequently updated – the 2010 ADA Standards incorporate the Access Board's 2006 ADA Accessibility Guidelines. Since its first publication in 1991, the ADA Standards have been updated once. Since that same time, the ICC A117.1 has been updated five (soon to be six) times.

Submitter Information Verification

Submitter Full Name: Jessica Hubert
Organization: Guardian Services Inc.
Affiliation: Representing the DARAC Advisory Committee
Street Address:
City:
State:
Zip:
Submittal Date: Fri Sep 01 13:19:54 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: FR-8898-NFPA 70-2024
Statement: The informative Annex J was deleted because the information it contained was outdated.

Informative Annex J — ~~ADA Standards for Accessible Design~~ ICC A117.1 Standards for Accessible and Usable Buildings and Facilities

This informative annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

The provisions cited in Informative Annex J are intended to assist the users of the *Code* in properly considering the various electrical design constraints of other building systems and are ~~part of the 2010 ADA Standards for Accessible Design. They are the same provisions as~~ those found in ~~ANSI/~~ICC A117.1-~~2009~~2017, *Accessible and Usable Buildings and Facilities*. The provisions of Section 307 Protruding Objects and SECTION 308 Reach Ranges of the ICC A117.1 are intended to meet or exceed the requirements of the 2010 ADA Standards and the Federal Fair Housing Amendments Act. However, differences may still exist. For example, the authority having jurisdiction may reference a different edition of the ICC A117.1 or, in a few cases, establish their own unique accessibility requirements.

J.1 Protruding Objects.

~~Protruding objects shall comply with Section **J.2**.~~ Replace this section with Section 307.1General from ICC A117.1-2017.

J.2 Protrusion Limits.

~~Objects with leading edges more than 685 mm (27 in.) and not more than 2030 mm (80 in.) above the finish floor or ground shall protrude a maximum of 100 mm (4 in.) horizontally into a circulation path.~~ *(See **Figure J.2**.)*

~~Exception: Handrails shall be permitted to protrude 115 mm (4½ in.) maximum.~~ Replace this section with Section 307.2 Protrusion limits from ICC A117.1-2017.

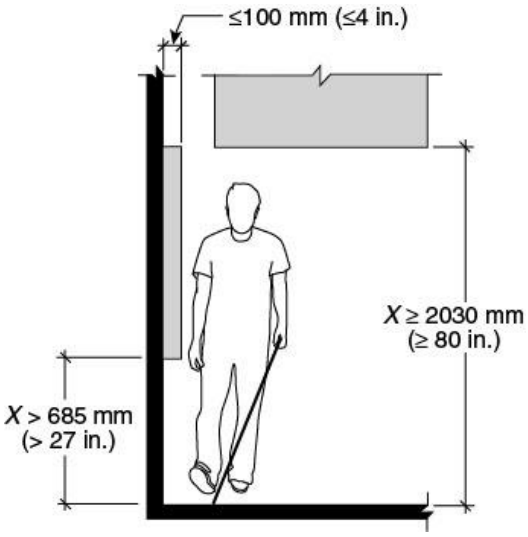


Figure J.2 ~~Limits of Protruding Objects.~~ Replace with Figure 307.2 LIMITS OF PROTRUDING OBJECTS from ICC A117.1-2017.

LIMITS OF PROTRUDING OBJECTS

J.3 Post-Mounted Objects.

~~Freestanding objects mounted on posts or pylons shall overhang circulation paths 305 mm (12 in.) maximum where located 685 mm (27 in.) minimum and 2030 mm (80 in.) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons, and the clear distance between the posts or pylons is greater than 305 mm (12 in.), the lowest edge of such sign or obstruction shall be 685 mm (27 in.) maximum or 2030 mm (80 in.) minimum above the finish floor or ground.~~ *(See* ***Figure J.3****.)*

~~Exception: The sloping portions of handrails serving stairs and ramps shall not be required to comply with Section J.3.~~ Replace this section with Section 307.3 Post-mounted objects from the ICC A117.1-2017.

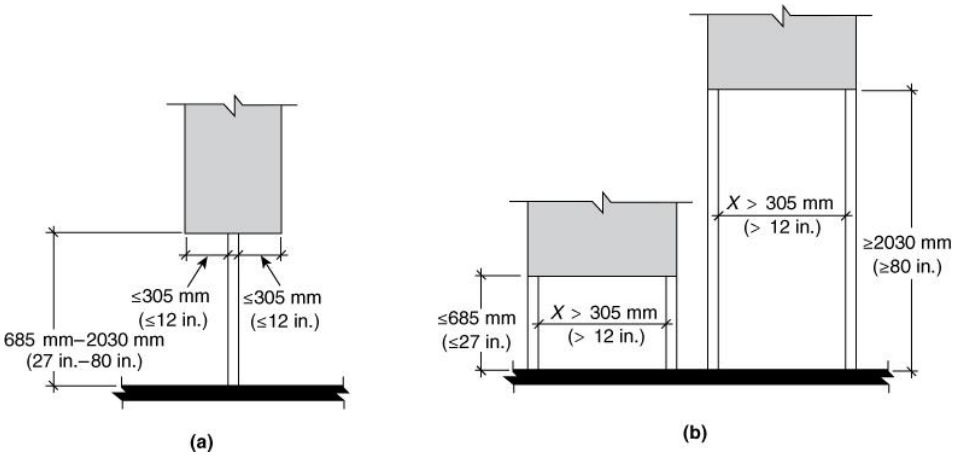


Figure J.3 ~~Post-Mounted Protruding Objects.~~ Replace these figures with Figures 307.3(a) POST-MOUNTED PROTRUDING OBJECTS and 307.3(b) POST-MOUNTED PROTRUDING OBJECTS from the ICC A117.1-2017.

J.4 Vertical Clearance.

~~Vertical clearance shall be 2030 mm (80 in.) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 2030 mm (80 in.) high. The leading edge of such guardrail or barrier shall be located 685 mm (27 in.) maximum above the finish floor or ground.~~ *(See **Figure J.4**.)*

~~*Exception: Door closers and door stops shall be permitted to be 1980 mm (78 in.) minimum above the finish floor or ground.*~~

Replace this section with Section 307.4 Vertical clearance of the ICC A117.1-2017.

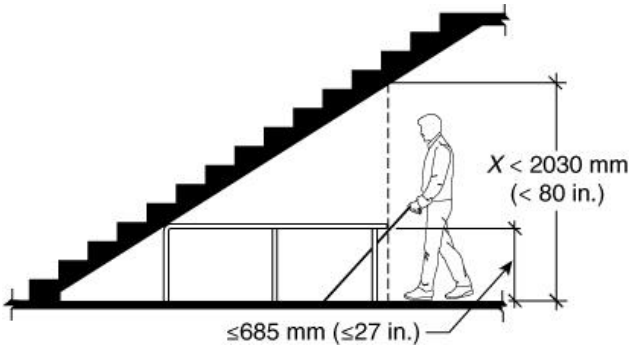


Figure J.4 Vertical Clearance. Replace this figure with Figure 307.4 REDUCED VERTICAL CLEARANCE from the ICC A117.1-2017.

~~J.5 Required Clear Width.~~

~~Protruding objects shall not reduce the clear width required for accessible routes.~~

Replace this section with Section 307.5 Required clear width from the ICC A117.1-2017.

J.6 ~~Forward~~ Reach Ranges.

J.6.1 ~~Unobstructed~~. Replace this section with Section 308.1 General from the ICC A117.1- 2017.

J.6.2 Unobstructed [forward reach]. ~~Where a forward reach is unobstructed, the high forward reach shall be 1220 mm (48 in.) maximum, and the low forward reach shall be 380 mm (15 in.) minimum above the finish floor or ground.~~ Replace this section with Section 308.2.1 Unobstructed from the ICC A117.1-2017.

*(See **Figure J.6.1**.)*

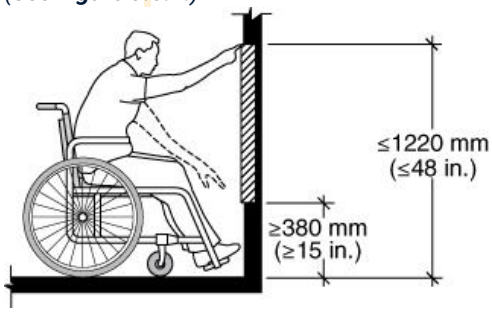


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Figure J.6.1 Unobstructed Forward Reach. Replace this figure with Figure 308.2.1 UNOBSTRUCTED FORWARD REACH from the ICC A117.1-2017.

J.6.2 Obstructed High Reach.

~~Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 1220 mm (48 in.) maximum where the reach depth is 510 mm (20 in.) maximum. Where the reach depth exceeds 510 mm (20 in.), the high forward reach shall be 1120 mm (44 in.) maximum, and the reach depth shall be 635 mm (25 in.) maximum.~~Replace this section with Section 308.2.2 Obstructed high reach from the ICC A117.1-2017.

*(See **Figure J.6.2**.)*

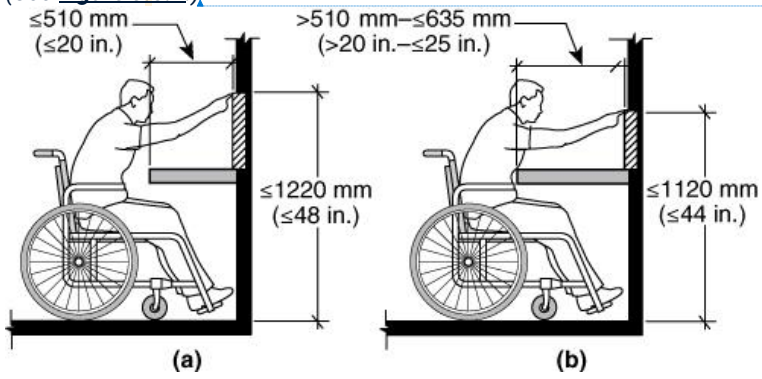

Figure J.6.2 Obstructed High Forward Reach. Replace these figures with FIGURE 308.2.2 OBSTRUCTED HIGH FORWARD REACH from the ICC A117.1-2017.

J.7 Side Reach.

J.7.1 Unobstructed.

~~Where a clear floor or ground space allows a parallel approach to an element, and the side reach is unobstructed, the high side reach shall be 1220 mm (48 in.) maximum, and the low side reach shall be 380 mm (15 in.) minimum above the finish floor or ground.~~ *(See **Figure J.7.1**.)*

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~~*Exception No. 1: An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 255 mm (10 in.) maximum.*~~

~~*Exception No. 2: Operable parts of fuel dispensers shall be permitted to be 1370 mm (54 in.) maximum, measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.*~~

Replace this section with Section 308.3.1Unobstructed [side reach] from ICC A117.1-2017, including Exceptions 1 and 2.

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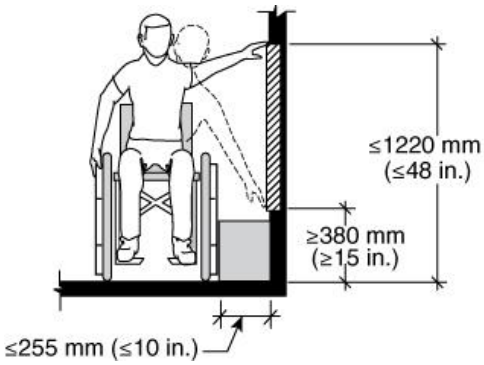

Figure J.7.1 Unobstructed Side Reach. Replace this figure with Figure 308.3.1 UNOBSTRUCTED SIDE REACH from the ICC A117.1-2017.

J.7.2 Obstructed High Reach.

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~~Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 865 mm (34 in.) maximum, and the depth of the obstruction shall be 610 mm (24 in.) maximum. The high side reach shall be 1220 mm (48 in.) maximum for a reach depth of 255 mm (10 in.) maximum. Where the reach depth exceeds 255 mm (10 in.), the high side reach shall be 1170 mm (46 in.) maximum for a reach depth of 610 mm (24 in.) maximum.~~

*(See **Figure J.7.2**.)*

~~*Exception No. 1: The top of washing machines and clothes dryers shall be permitted to be 915 mm (36 in.) maximum above the finish floor.*~~

~~*Exception No. 2: Operable parts of fuel dispensers shall be permitted to be 1370 mm (54 in.) maximum, measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs*~~. Replace this section including its exceptions with Section 308.3.2 Obstructed High Reach] from ICC A117.1-2017.

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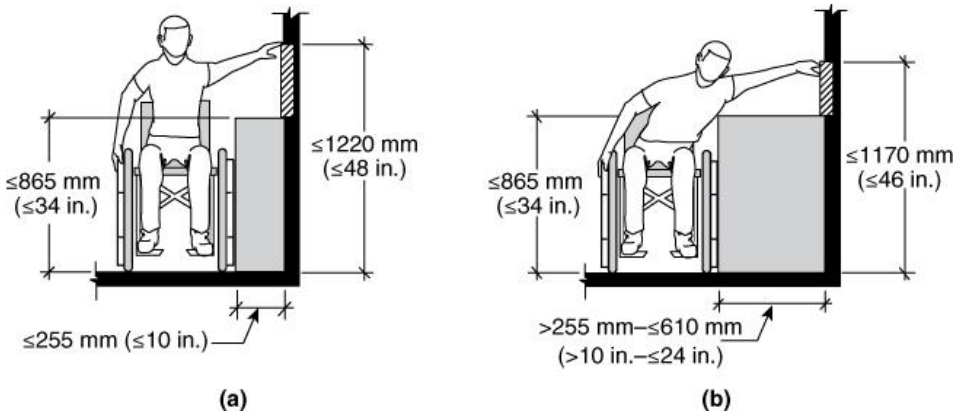

Figure J.7.2 Obstructed High Side Reach. Replace these figures with Figures 308.3.2(A) OBSTRUCTED HIGH SIDE REACH and 308.3.2(B) OBSTRUCTED HIGH SIDE REACH from the ICC A117.1-2017.

Reason Statement:

We urge the committee to revise this Annex to reference or reproduce (with permission) the accessibility requirements of the ICC A117.1-2017 *Accessible and Usable Buildings and Facilities* or, if available prior to publication of the next edition of the NEC, the ICC A117.1-2023 currently in development. Alternatively, the committee could delete this Annex in its entirety.

Currently, the differences between the 2010 Americans with Disabilities Act (ADA) Standards which are reproduced in the Annex and the ICC A117.1-2017 are minimal.

However, the information in the current Annex is dated and will not satisfy building codes referencing the 2017 and 2023 Editions of the ICC A117.1. For example, Section J3 permits a 12-inch protrusion on each side of a post or pylon while ICC A117.1-2017 permits a protrusion of 4 inches maximum.

TIA No. 1679 raised concerns regarding inconsistencies in terminology and the need for coordination of the 2023 Edition of the NEC and the ICC A117.1. The TIA failed and an appeal was submitted (see Standards Council Final Decision D#22-15). Although the appeal did not result in the desired actions, the Council requested that the appellant work with DARC to resolve the matter. Several DARAC members are also ICC A117 Committee members. DARAC's recommendation to revise this Annex to reflect accessibility requirements referenced by ICC's International Building Code (IBC) and most adopted buildings codes in the U.S. is the first step in this process.

Secondly, it is likely that 2023 Edition of the ICC A117.1 will contain revisions in terminology and its technical provisions to resolve conflicts between the 2023 NEC and the ICC A117.1 regarding the location of accessible receptacle outlets. The NEC Annex should highlight these revisions when they are available – hopefully prior to publication of the next edition. Designers and installers will need to be familiar with both the NEC and ICC A117.1 requirements to successfully comply. The older criteria in the 2010 ADA Standards will not suffice.

The ICC A117.1 is referenced in building codes across the nation. The intent of the Standard is to meet or exceed the accessibility requirements of the ADA and the Fair Housing Act. The ADA Standards are infrequently updated – the 2010 ADA Standards incorporate the Access Board's 2006 ADA Accessibility Guidelines. Since its first publication in 1991, the ADA Standards have been updated once. Since that same time, the ICC A117.1 has been updated five (soon to be six) times.

Public Input No. 4125-NFPA 70-2023 [New Definition after Definition:]

ANNEX L

Conductor Material and Marking for Listed Wire Connectors and Terminals.

ANNEX L Table 1 - Marking for Listed Wire Connectors and Terminals.

Marking (or Equivalent)	Type of Conductor Suitable for Use With		
	Single Conductor in an Opening	Two or More Conductors in an Opening	
		Connectors, Other Than Splicing Wire Connectors	Splicing Wire Connectors
"CU"	Copper	Copper to Copper	Copper to Copper
"AL"	Aluminum	Aluminum to Aluminum	Aluminum to Aluminum
"CC"	CCA	N/A	CCA to CCA
"AL-CU" or "CU-AL"	Copper Aluminum CCA	Copper to Copper Aluminum to Aluminum Copper to Aluminum [1] CCA to CCA Copper to CCA [2] Aluminum to CCA [1]	Copper to Copper Aluminum to Aluminum CCA to CCA
"CC-CU"	Copper CCA	CCA to CCA Copper to CCA [2]	N/A
"CC-CU (intermixed – dry locations)"	N/A	N/A	Copper to CCA [2]
"CC-AL (intermixed – dry locations)"	CCA Aluminum	CCA to CCA CCA to Aluminum [2]	N/A
"AL-CU (intermixed – dry locations)"	Copper CCA Aluminum	Copper to Copper Aluminum to Aluminum Copper to Aluminum [2] CCA to CCA Copper to CCA [2] Aluminum to CCA [2]	Copper to Aluminum [2] Copper to CCA [2] Aluminum to CCA [2]

Statement of Problem and Substantiation for Public Input

This is the new ANNEX and Table supporting the PI-4115 to build information awareness for splicing and temrinating of copper-clad-aluminum wiring. This table will serve as a resource ensuring the proper listing and rating for wire connectors, terminals, and splicing devices.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4115-NFPA 70-2023 [Section No. 110.14]	

Submitter Information Verification

Submitter Full Name: Kyle Krueger
Organization: NECA
Affiliation: NECA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 17:18:42 EDT 2023
Committee: NEC-P01

Committee Statement

Resolution: Proposed Committee Statement for a Resolve: The information provided in the table, which is intended to be helpful, has the potential for misapplication. Specifically, the information is associated with requirements in specific UL Product Standards. The potential misapplication can result due to the fact that this information is specific to one set of UL Product Standards; however, requirements for how terminations are marked vary between standards, making the details in this table incomplete. In addition, UL product standards, similar to the NEC, are routinely updated. Changes to the product standard may result in the information in the NEC becoming inaccurate.