Public Comment No. 1658-NFPA 70-2024 [Global Input]

This Global Public Comment is for CMP-18 to review the use of the terms "overcurrent", "overcurrent protective devices" and "overcurrent protection".

Additional Proposed Changes

File Name CMP-18 OCPD TG-4 CMP-10.pdf All CMP Comments Files from CMP-10 TG- All CMP Comments Files from 4.pdf

Description CMP-18 OCPD TG-4 CMP-10 CMP-10 TG-4

Approved

Statement of Problem and Substantiation for Public Comment

This Public Comment is submitted on behalf of a Task Group formed under the purview of Code Making Panel 10 consisting of Randy Dollar, Thomas Domitrovich, Jason Doty, Diane Lynch, Alan Manche, Nathan Philips, David Williams, and Danish Zia. This Public Comment, along with other Public Comments, was developed with the goal of improving usability and accuracy on requirements associated with overcurrent protective devices.

The Task Group reviewed all instances of the term "overcurrent", "overcurrent protective devices" and "overcurrent protection" and provided recommended changes to align proposed and current defined terms.

For consistency, the task group chose to use the full defined term "overcurrent protective device" in the title of all sections or subdivisions and the acronym "OCPD" or "OCPDs" when used in the body of each code section.

The term overcurrent protection applies to the application of an overcurrent protective device OCPD, to protect conductors and equipment.

Two documents are attached: One for your specific code panel and the other is a comprehensive document illustrating all of the code-wide comments made by this task group.

The current term "Overcurrent Protective Device, Branch-Circuit" is being deleted and the new defined term "Overcurrent Protective Device (OCPD)" will be used instead.

The following are the proposed terms being submitted to CMP-10.

PC 1639 Overcurrent Protection. Automatic interruption of an overcurrent

PC 1636 Overcurrent Protective Device (OCPD). A device capable of providing protection over the full range of overcurrent between its rated current and its interrupting rating. (CMP-10)

Informational Note 1: Prior editions of NFPA 70 included the defined term "branch circuit overcurrent protective device" for overcurrent protective devices suitable for providing protection for service, feeder and branch circuits. This term has been revised to a generalized term of "overcurrent protective device" (OCPD). The specific requirements using this term may include modifiers (such as branch OCPD, feeder OCPD, service OCPD) to specify location or application of the OCPD, or to specify variations (such as supplementary OCPD).

Informational Note protection for servi	2: See 240.7 for a list of overcurrent protective devices suitable for providing ice, feeder, branch circuits and equipment.	
• Global PI 4050 •	elated Item PC 1636 • PC 1639	
Submitter Informa	tion Verification	
Submitter Full Na	me: David Williams	
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Street Address:		
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Zip. Submittal Date:	Sup Aug 25 21:58:44 EDT 2024	
Committee:	NEC-P18	
Committee Statement		
Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7936-NFPA 70-2024</u>	
Statement:	The term "overcurrent device" was removed and replaced with the acronym "OCPD" for consistency.	

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-18			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
18	Article 393			
	393.45. Title	Overcurrent Protection	Overcurrent Protection	
	393.45(A)	Overcurrent Protection	Fine as is	
18	Article 406			
	406.46(F)	Overcurrent Device	OCPD	
18	Article 410			
	410.59(A)	Branch-circuit overcurrent devices	Branch-Circuit OCPD	
	410.153	Overcurrent Protection	Fine as is	
18	Article 600			
	600.41	Overcurrent	CMP to Review	

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-1			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
1	Article 110			
	110.10.	overcurrent protective devices	OCPDs	
	110.10.	circuit protective devices	Fine as is	
	110.26(C)(2)	overcurrent devices	OCPD	
	110.26(C)(3)	overcurrent devices	OCPD	
	110.52	Overcurrent protection	Fine as is	
	110.52	Overcurrent	Motor-operated Equipment shall be provided with	
			overcurrent protection	
			Transformers shall be provided with overcurrent	
	110.52	Overcurrent	protection	

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-2		
CMP	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language
2	Article 100		
	Branch Circuit (Branch-Circuit)	overcurrent device	overcurrent protective device (OCPD)
2	Article 120		
	120.5(E)	overcurrent device	OCPD
	120.7(B)	overcurrent protective device	OCPD
	120.87(3)	Overcurrent protection	Fine as is
2	Article 210		
	210.4(A)	branch-circuit overcurrent protective device, OCPD	Fine as is
	210.4(C)	branch-circuit OCPD	Fine as is
	210.11(B)	branch-circuit OCPD	Fine as is
	210.12(A)	branch-circuit OCPD (X-8)	Fine as is
	210.18	overcurrent device OCPD (X-2)	Fine as is
	210.19(A)(1)EX	branch-circuit OCPD	Fine as is
	210.20.	Overcurrent protection	Fine as is
	210.20.	branch-circuit OCPD	Fine as is
	210.20(A)	branch-circuit OCPD	Fine as is
	210.20(C)	branch-circuit OCPD	Fine as is
	T-210.24	Overcurrent protection	Fine as is
2	Annex D		
		Overcurrent Protection	CMP-2 To review references to OCPD and the revised
	D3. (X2)		terms.
	D3a. (X8)	Branch-Circuit OCPD	CMP-2 to Review
	D3a.	Overcurrent Protection	CMP-2 to Review
	D3a. (X2)	Branch-Circuit OCPD	CMP-2 to Review

	CMP-10 TG-4 Review of Ov	ercurrent Language for the Articles undee	r the purview of CMP-3
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language
3	Article 100		
	Fault Managed Power.	Overcurrent protection	Fine as is
	Fire Alarm Circuit	Overcurrent device	overcurrent protective device (OCPD)
3	Article 300		
	300.5-T	Overcurrent Protection	Fine as is
	300.17(l)	Overcurrent Device	OCPD
	300.28(C)(3). (X5)	Overcurrent Protection	Fine as is
3	Article 590		
	590.6(A)	Overcurrent Protection	Fine as is
	590.6(B)	be protected from Overcurrent	shall be provided with overcurrent protection
	590.9. Title	Overcurrent protective device	Fine as is
	590.9(A)	Overcurrent protective devices	OCPDs
	590.9(B) Title	Service Overcurrent protective devices	Fine as is
	590.9(B)	Overcurrent protective devices	OCPDs
3	Article 721		
	721.50(A)	Overcurrent	Fine as is
3	Article 722		
	722.1	Overcurrent Protection	Fine as is
3	Article 724	Class 1	
	724.40(B). (X3)	Overcurrent Devices	OCPDs
	724.40(B). (X2)	Overcurrent Device	OCPD
	724.40(B). (X2)	Overcurrent Protection	Fine as is
	724.43. (X4)	Overcurrent Protection	Fine as is
	724.45	Overcurrent Device	OCPD
	724.45. (X3)	Overcurrent Devices	OCPDs
	724.45(A)	Overcurrent Devices	OCPDs
	724.45(B)	Overcurrent Protection	Fine as is
	724.45(B)	Overcurrent Device	OCPD
	724.45(C). (X2)	Overcurrent protective devices	OCPDs
	724.45(D)	Overcurrent Protection	Fine as is
	724.45(E)	Overcurrent Protection	Fine as is
3	Article 725		
	725.1 ln	Overcurrent Protection	Fine as is

	725.127	Overcurrent Device	OCPD
3	Article 760		
	760.41(B)	Overcurrent protective device	OCPD
	760.41(B)	Overcurrent protection devices	OCPDs
	760.43. (X3)	Overcurrent Protection	Fine as is
	760.45. Title	Overcurrent device	Overcurrent protective device
	760.45	Overcurrent protection devices	OCPDs
	760.45 Ex 1 & 2	Overcurrent Protection	Fine as is
	760.121(B)	Branch-Circuit Overcurrent protective device	OCPD
	760.121(B)	Overcurrent protection devices	OCPDs
	760.127	Overcurrent Protection	Fine as is
	760.127	Overcurrent Device	OCPD
3	Article 794		
	794.1	Overcurrent Protection	Fine as is

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-4		
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language
4	Article 690		
	690.2	PV dc Overcurrent protective devices	PV dc OCPDs
	690.8	Overcurrent Device	OCPD and OCPDs
	690.9. Title	Overcurrent Protection	Fine as is
	690.9(A). (X2)	be protected from Overcurrent	shall be provided with overcurrent protection
	690.9(A)(1). Title	Overcurrent Protection	Fine as is
	690.9(A)(1).	Overcurrent protective devices	OCPDs
	690.9(A)(2). Title	Overcurrent Protection	Fine as is
	690.9(A) (2)	be protected from Overcurrent	shall be provided with overcurrent protection
	690.9(A) (2) In	Overcurrent protection	Fine as is
	690.9(A) (2) In	Overcurrent device	OCPD
	690.9(A)(3)	Overcurrent	Fine as is
	690.9(B)	shall be permitted to prevent overcurrent of conductors	Fine as is
	690.9(B)	Overcurrent device	OCPD and OCPDs
	690.9(C)	Overcurrent protective device and Devices	OCPD and OCPDs
	690.31(E)	Overcurrent protective devices	OCPDs
	690.45	Overcurrent protective device	OCPD
	690.45	Overcurrent Device	OCPD
4	Article 692		
	692.8. Title	Overcurrent Device	Overcurrent Protective Devices
	692.8	Overcurrent protective device	OCPDs
	692.9	Overcurrent Protection	Fine as is
	692.9	Overcurrent Devices	OCPDs
4	Article 694		
	694.7(D)	Overcurrent Device	OCPD
	694.12(B). Title	Overcurrent Device	Overcurrent Protective Device
	694.12(B)(2). Title	Overcurrent Devices	Overcurrent Protective Devices
	694.12(B)(2)	Overcurrent Devices	OCPDs
	694.15	Overcurrent Protection	Fine as is
	694.15	Overcurrent Devices	OCPDs
	694.15 In	Overcurrent Protection	Fine as is
	694.15(B)(1)	Overcurrent Protection	Fine as is
	694.15(C)	Overcurrent Devices	OCPDs

4	Article 705		
	705.11(C). Title	Overcurrent Protection	Fine as is
	705.11(C)	be protected from overcurrent	have overcurrent protection
	705.11(C)(1). (1)(2)(3)	Overcurrent protective device	OCPD
	705.11(C)(2)	Overcurrent protection devices	OCPDs
	705.12(A)(2). (X4)	Overcurrent Device	OCPD
	705.12(A)(3)	Overcurrent Devices	OCPDs
	705.12(B)	(Multiple) Overcurrent Device and (s)	OCPD. And OCPDs
	705.12(B)	(Warning labels) Overcurrent Device and (s)	Overcurrent Protective Device and Devices
	705.28(B)Ex.1	Overcurrent Devices	OCPDs
	705.28(B)Ex.3	Overcurrent Device	OCPD
	705.30. Title	Overcurrent Protection	Fine as is
	705.30(A). (X2)	Overcurrent Protection	Fine as is
	705.30(A)	Overcurrent Devices	OCPDs
	705.30.(C)	Overcurrent Devices	OCPDs
	705.30.(F)	Overcurrent Protection	Fine as is
	705.70.	Overcurrent Devices	OCPDs
	705.70.	Overcurrent Protection	Fine as is

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-5			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
5	Article 100			
	Ground-Fault Current Path, Effective	overcurrent protective device	overcurrent protective device (OCPD)	
	Ground-Fault Protection of Equipment	overcurrent device	overcurrent protective device (OCPD)	
5	Article 200			
	200.10(E)	overcurrent device	OCPD	
5	Article 250			
	250.4(A)(5). Title	Overcurrent protective Device	Fine as is	
	250.4(A)(5)	Overcurrent Device	OCPD	
	250.4(B)(4)	Overcurrent Devices	OCPDs	
	250.30(A)(1)	Overcurrent Device	OCPD	
	250.30(A)(1)	Overcurrent Devices	OCPDs	
	250.32(B)(2). (X4)	Overcurrent Protection	Fine as is	
	250.32(C)(2). (X4)	Overcurrent Protection	Fine as is	
	250.35(B)	Overcurrent Protection	Fine as is	
	250.36(D)	Overcurrent Device	Fine as is	
	250.36(E)(1)	Overcurrent Device	OCPD	
	250.102(B)(2)	Overcurrent Protection	Fine as is	
	250.102(D). (X3)	Overcurrent Devices	OCPDs	
	250.118(A)(5)	Overcurrent Devices	OCPDs	
	250.118(A)(6)	Overcurrent Devices	OCPDs	
	250.118(A)(7)	Overcurrent Devices	OCPDs	
	250.122(C)	Overcurrent Device	OCPD	
	250.122(F)(1). (X3)	Overcurrent protective device	OCPD	
	250.122(G)	Overcurrent Device	OCPD	
	250.142. (X2)	Overcurrent Device	OCPD	
	250.148	Overcurrent Device	OCPD	
	250.164	Overcurrent Device	OCPD	
	250.166	Overcurrent Protection	Fine as is	
	250.169	Overcurrent Devices	OCPD	
5	Article 270			
	270.4(A)(5)	Overcurrent Device	OCPD	
	270.4(B)(4)	Overcurrent Devices	OCPDs	
	270.30(A)(1)	Overcurrent Devices	OCPDs	

270.32(B)(2). (X4)	Overcurrent Protection	Fine as is
270.32(C)(2). (X4)	Overcurrent Protection	Fine as is
270.35(B)	Overcurrent Protection	Fine as is
270.35(B)	Overcurrent protective device	OCPD
270.36(D)	Overcurrent Device	OCPD
270.36(E)	Overcurrent Devices	OCPDs
270.102(C)(2)	Overcurrent Protection	Fine as is
270.102(D)	Overcurrent Device	OCPDs
270.114(C)(3)	Overcurrent setting	CMP to review Language based on new terms
270.118	Overcurrent Devices	OCPDs
270.142	Overcurrent Devices	OCPDs
270.148(B)	Overcurrent Device	OCPD
270.164(B)	Overcurrent Device	OCPD
270.166(A)	Overcurrent Protection	Fine as is
270.169	Overcurrent Devices	OCPDs

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-6		
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language
6	Article 310		
	310.10(G).	Overcurrent Protection	Fine as is
	310.15(A)	Overcurrent Protection	Fine as is
	310.16-T	Overcurrent Protection	Fine as is
	310.17-T	Overcurrent Protection	Fine as is
6	Article 335		
	335.90.	Overcurrent Protection	Fine as is
6	Article 382		
	382.4	Supplementary Overcurrent Protection	Supplementary Overcurrent Protective Device
6	Article 400		
	400.16	Overcurrent Protection	Fine as is
	400.16	protected against Overcurrent	shall be provided with overcurrent protection
6	Article 402		
	402.14 (X2)	Overcurrent Protection	Fine as is

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-7			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
7	Article 100			
	Service Equipment, Mobile Home	overcurrent protective devices	overcurrent protective devices (OCPDs)	
7	Article 545			
	545.24	Branch-circuit overcurrent protective device	Branch-circuit OCPD	
	545.24(B) Title	Branch Circuit Overcurrent Protection Device	Overcurrent protective devices	
	545.24(B)	a Branch Circuit Overcurrent Protective Device	an OCPD	
7	Article 547			
	547.41(A)(6). (X2)	Overcurrent Protection	Fine as is	
	547.41(B)	Overcurrent Protection	Fine as is	
	547.42	Overcurrent Protection	Fine as is	
7	Article 550			
	550.11(B). Title	Branch-Circuit protective equipment	Branch-Circuit Overcurrent Protection	
	550.11(B)	Overcurrent Protection	Fine as is	
	550.11(B)	Branch-Circuit Overcurrent Devices	OCPDs	
	550.11(B)	Overcurrent protection size	OCPD rating	
	550.15(E)	Branch-circuit overcurrent protective device	OCPD	
	550.32	Overcurrent Protection	Fine as is	
7	Article 551			
	551.31(A)	Overcurrent protective device	OCPD	
	551.31(C)	Overcurrent protective device	OCPD	
	551.31(D)	Overcurrent Protection	Fine as is	
	551.42	Overcurrent Protection	Fine as is	
	551.43. Title	Branch-Circuit protection	Branch-Circuit Overcurrent Protection	
	551.43(A)	Branch Circuit Overcurrent Devices	Branch-Circuit OCPDs	
	551.43(A)(3)	Overcurrent Protection	Fine as is	
	551.45(C)	Overcurrent protective device	OCPD	
	551.47(Q)	Overcurrent protective device	OCPD	
	551.47(R)	Overcurrent Protection	Fine as is	
	551.47(S)	Overcurrent Protection	Fine as is	
	551.74	Overcurrent Protection	Fine as is	
7	Article 552			
	552.10.(E) Title	Overcurrent Protection	Fine as is	
	552.10(E)(1)	Overcurrent protective devices	OCPDs	

	T-552.10(E)(1)	Overcurrent Protection	Fine as is
	552.10(E)(4). (X2)	Overcurrent protective device	OCPD
	552.42(A)	Branch Circuit Overcurrent Devices	OCPDs
	552.42(A)	Overcurrent Protection	Fine as is
	552.45(C)	Overcurrent protective device	OCPD
	552.46(A) IN	Overcurrent Protection	Fine as is
	552.47(P)	Overcurrent protective device	OCPD
	552.47(Q)	Overcurrent Protection	Fine as is
7	Article 555		
	555.53	Overcurrent protective device	OCPD
7	Article 675		
	675.6	Branch Circuit Overcurrent Protective Device	OCPD
	675.7	Branch Circuit Overcurrent Protective Devices	OCPDs
	675.8	Overcurrent Protection	Fine as is
7	Article 682		
	682.15(B)	Feeder Overcurrent protective device	Feeder OCPD

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-8			
CMP	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
8	Article 312			
	312.11. Title	Overcurrent Devices	Overcurrent Protective Device	
	312.11	Overcurrent Devices	OCPDs	
	312.11(A). (X3)	Overcurrent Device	OCPDs	
	312.11(B)	Overcurrent Devices	OCPDs	
	312.11(B)(1)	Overcurrent Device	OCPD	
8	Article 366			
	366.12	Overcurrent Devices	OCPDs	
	366.56(D)	Overcurrent Protection	Fine as is	
8	Article 368			
	368.17(A). Title	Overcurrent Protection	Fine as is	
	368.17	Overcurrent Protection	Fine as is	
	368.17(A)	Protected against Overcurrent	shall be provided with overcurrent protection	
	368.17(B). (X2)	Overcurrent Protection	Fine as is	
	368.17(B)	Overcurrent Device	OCPD	
	368.17(C)	Overcurrent Devices	OCPDs	
	368.17(C)Ex.2	Branch-Circuit Overcurrent Device	Branch-Circuit OCPD	
	368.17(C)Ex.3	Overcurrent Device	OCPD	
	368.17(C)Ex.4	Branch-Circuit overcurrent plug-in device	CMP to review Language based on new terms	
	368.17(D). Title	Overcurrent Protection	Fine as is	
	368.17(D)	Protected against Overcurrent	shall be provided with overcurrent protection	
8	Article 370			
	370.23. Title	Overcurrent Protection	Fine as is	
	370.23	Protected against Overcurrent	shall be provided with overcurrent protection	
8	Article 371			
	371.17. Title	Overcurrent Protection	Fine as is	
	371.17	Overcurrent Protection	Fine as is	
	371.17 (A)-(C). Titles	Overcurrent Protection	Fine as is	
	371.17(A)-(C)	Protected against Overcurrent	shall be provided with overcurrent protection	
	371.17(D)	Protected against Overcurrent	shall be provided with overcurrent protection	
	371.17(F)	Overcurrent	shall be provided with overcurrent protection	
	371.17(G)	Overcurrent Protection		
	371.17(G)Ex	Overcurrent Protection	Fine as is	
	371.17(G)Ex	Overcurrent Device	OCPD	

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-9			
CMP	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
9	Article 265			
	265.18	Overcurrent Device	OCPD	
	265.20.	Overcurrent Protection	Fine as is	
	265.20.	Overcurrent protective devices	OCPDs	
	265.20.	Overcurrent Devices	OCPDs	
9	Article 266			
	266.1	Overcurrent Protection	Fine as is	
	266.5	Overcurrent Protection	Fine as is	
	266.5	Protected against overcurrent	shall be provided with overcurrent protection	
	266.5	Overcurrent Device	OCPD	
9	Article 268			
	268.2. (X2)	Overcurrent Protection	Fine as is	
	268.70(F)	Overcurrent Devices	OCPDs	
	268.82. (X4)	Overcurrent Protection	Fine as is	
	Art. 268 Part VII	Overcurrent Protection	Fine as is	
	268.90.	Overcurrent Device	OCPD	
	268.90.	Overcurrent Devices	OCPDs	
	268.91	Overcurrent Device	OCPD	
	268.92	Overcurrent Devices	OCPDs	
	268.93	Overcurrent Device	OCPD	
9	Article 450			
	450.5 (previously 450.3). (X3)	overcurrent protection	Fine As Is	
	450.5(A) and Table. (X3)	overcurrent protection	Fine As Is	
	Table 450.5(A) Footnote 2. (X4)	overcurrent device	OCPD	
	450.5(B)	overcurrent protection	Fine As Is	
	Table 450.5(B) and Table (X2)	overcurrent protection	OCPD	
	Table 450.5(B) Footnote 2. (X3)	overcurrent device	OCPD	
	Table 450.5(B) Footnote 3	overcurrent protection	OCPD	
	450.6(A) Title	overcurrent protection	Fine As Is	
	450.6(A) (X3)	overcurrent device	OCPD	
	450.6(A) Exception	overcurrent device	OCPD	
	450.7(A)(1). (X2)	overcurrent protection	OCPD	
	450.7(A)(2). Title	overcurrent protection	Fine As Is	

		overcurrent sensing device	Fine As Is
	450 7(4)(2)	overcurrent protection	OCPD
	430.7 (A)(Z)	overcurrent device	OCPD
		branch or feeder protective devices	branch or feeder OCPDs
	450.7(A)(3)	overcurrent device	OCPD
	450.7(B)(2)	overcurrent protection	Fine As Is
	450.7(B)(2)(a)	overcurrent protective device	OCPD
	450.7(B)(2)(b)	overcurrent protection	OCPD
	450.7(B)(2)(b)	overcurrents	Fine As Is
	450.7(B)(2)(b) Exception	overcurrent device	OCPD
	450.8(A). (X2)	overcurrent protection	Fine As Is
	450.8(A)(1)	overcurrent protection	Fine As Is
	450.8(A)(2)	overcurrent protection	Fine As Is
	450.8(A)(3)	protective device	OCPD
	450.8(A)(4)(a)	protective device	OCPD
	450.8(B). Title	Overcurrent Protection	Fine As Is
	450.8(B)	overcurrent device	OCPD
	450.9	overcurrent protection	Fine As Is
	450.9	protective devices (2x)	OCPDs
	450.23(A)(1)(d) Informational Note	overcurrent protection	OCPD
	450.23(B)(1) Informational Note 2	overcurrent protection	OCPD
9	Article 495		
	495.62. Title	Overcurrent Protection	Fine As Is
	495.72	Overcurrent Relay	Fine As Is

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-10			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
10	Article 100			
	Circuit Breaker	Overcurrent	Fine as is	
	Coordination, Selective. (Selective Coordination)	Overcurrent condition	Fine as is	
	Coordination, Selective. (Selective Coordination)	overcurrent protective devices	overcurrent protective devices (OCPDs)	
	Coordination, Selective. (Selective Coordination)	overcurrents	Fine as is	
	Coordination, Selective. (Selective Coordination)	overcurrent protective device	overcurrent protective device (OCPD)	
	Current Limiting (as applied to overcurrent protection	overcurrent protection devices		
	devices)		overcurrent protective devices (OCPDs)	
	Feeder	final branch-circuit overcurrent protective device	overcurrent protective device (OCPD)	
	Fuse	overcurrent protective device	overcurrent protective device (OCPD)	
	Fuse	overcurrent	Fine as is	
	Fuse, Electronically Actuated	overcurrent protective device	overcurrent protective device (OCPD)	
	Fuse, Electronically Actuated	overcurrent	Fine as is	
	Overcurrent	Overcurrent protection	Fine as is	
	Overcurrent Protective Device, Branch-Circuit	Revise with the term Overcurrent Protective Device.		
		(OCPD)		
	Overcurrent Protective Device, Supplementary (need	overcurrent protective device	overcurrent protective device (OCPD)	
	to Revise term with acronym)			
	Panelboard	overcurrent devices	overcurrent protective devices (OCPDs)	
	Surge-Protective Device (SPD). (X2)	overcurrent device. (X2)	overcurrent protective device (OCPD)	
	Switchboard	overcurrent	overcurrent protective devices (OCPDs)	
	Tap Conductor	Overcurrent protection	Fine as is	
10	Article 215			
	215.1	Overcurrent protection	Fine as is	
	215.4(A)(1)Ex.1	overcurrent devices protecting the feeders	feeder OCPD	
	215.4(A)(1)Ex.3	overcurrent device	OCPD	
	215.5 Title	Overcurrent protection	Fine as is	
	215.5	Feeders shall be protected against overcurrent	Feeders shall be provided with overcurrent protection	
			in accordance with Article 240, Parts I	
	215.5	overcurrent device	OCPD	
	215.5Ex	overcurrent device protecting the feeders	feeder OCPDs	
	215.5Ex	overcurrent device	OCPD	

	215.18(B)	branch circuit overcurrent devices	OCPDs
10	Article 225		
	225.40. Title	Overcurrent protective devices	Fine as is
	225.40.	feeder overcurrent device (x2)	feeder OCPD
	225.40.	branch circuit overcurrent devices	Branch circuit OCPDs
	225.42(B)	branch circuit overcurrent devices	OCPDs
10	Article 230		
	230.7 Ex.2	Overcurrent protection	Fine as is
	230.42(A)(1)	overcurrent device (X3)	OCPD
	230.82(6)	Overcurrent protection	Fine as is
	230.82(7)	Overcurrent protection	Fine as is
	230.82(8)	Overcurrent protection	Fine as is
	230.82(9)	Overcurrent protection	Fine as is
	230.82(10)	Overcurrent protection	Fine as is
	230 Part VII	Overcurrent protection	Fine as is
	230.90(A)	overcurrent device	OCPD
	230.90(A)Ex.3	overcurrent device	OCPD
	230.90(B)	overcurrent device	OCPD
	230.91	overcurrent device (X2)	OCPD
	230.92	overcurrent device (X4)	OCPDs and OCPD
	230.93	overcurrent device	OCPD
	230.94	overcurrent device (X3)	OCPD
	230.94	Overcurrent protection (X2)	Fine as is
	230.95(A)	overcurrent device	OCPD
	230.95(B)	overcurrent device	OCPD
10	Article 240		
	240	Overcurrent Protection	Fine as is
	240.1 (X3)	Overcurrent protection	Fine as is
	240.2	branch-circuit Overcurrent protective devices	branch-circuit-Overcurrent protective devices
	240.4. Title	Protection of Conductors	Overcurrent Protection of Conductors
	240.4		shall be provided with overcurrent protection in
		Protected against overcurrent	accordance with
	240.4(B). Title	Overcurrent devices	Overcurrent protective Devices
	240.4(B)	Overcurrent device	OCPD
	240.4(B)	Overcurrent protective device	OCPD

240.4(C). Title	Overcurrent devices	Overcurrent protective Devices
240.4(C). (X2)	Overcurrent device.	OCPD
240.4(D)	Overcurrent Protection	Fine as is
240.4(D)(1)	Overcurrent protection	Fine as is
240.4(D)(1)(2)		(a) OCPDs in accordance with 240.7 shall be marked for
		use with 18 AWG copper conductor
		(b) Delete
		(c) change to (b)
240.4(D)(2)	Overcurrent protection	Fine as is
240.4(D)(2)(2)		(a) OCPDs in accordance with 240.7 shall be marked for
		use with 16 AWG copper conductor
		(b) Delete
		(c) change to (b)
240.4(D)(3)	Overcurrent protection	Fine as is
240.4(D)(3)(2)		(a) Fuses and circuit breakers in accordance with 240.7
		marked for use with 14 AWG copper-clad aluminum
		conductor
		(b) Delete
240.4(D)(3)(2)		OCPDs in accordance with 240.7 shall be marked for use
		with 14 AWG copper-clad aluminum conductor
240.4(E)	Protected against overcurrent	shall be permitted to have overcurrent protection in
		accordance with the following
240.4(F)	Overcurrent protection	Fine as is
240.4(F)	Overcurrent protective device	OCPD
240.4(G). (X2)	Overcurrent protection	Fine as is
240.4(H)		shall be provided with overcurrent protection in
	Protected against overcurrent	accordance with
240.5		shall be provided with overcurrent protection in
	Protected against overcurrent	accordance with
240.5(A)	Overcurrent device	OCPD
240.5(A)	Protected against overcurrent	Fixture wires shall be provided with overcurrent
		protection in accordance with
240.5(A)	Supplementary overcurrent protection	Fine as is
240.5(B) Title	Branch-circuit overcurrent device.	Branch-Circuit Overcurrent protective Devices

240.9	Protection of conductors against overcurrent	Fine as is
240.10. Title	Supplementary Overcurrent protection	Fine as is
240.10.	Supplementary overcurrent protection	Fine as is
240.10.	Branch-Circuit overcurrent devices	OCPDs
240.10.	Supplementary overcurrent devices	Supplementary OCPDs
240.11. (X2)	Feeder overcurrent protective devices.	Feeder OCPDs
240.11. (X2)	Service overcurrent protective device.	Service OCPD
240.15(A). Title	Overcurrent device	Overcurrent protective device required
240.15(A)	Overcurrent device	OCPD
240.15(A)	Overcurrent trip. Overcurrent relay	Fine as is
240.15(B) Title	Overcurrent device	Circuit breaker as Overcurrent protective device
240.16	Branch circuit overcurrent protective devices	OCPDs
240.21	Overcurrent Protection	Fine as is
240.21	overcurrent protective device	OCPD
240.21 (A)	Overcurrent Protection	Fine as is
240.21 (B)	Overcurrent Protection	Fine as is
240.21 (B) (1) (1) (b)	Overcurrent device(s)	OCPDs
240.21 (B) (1) (1) (b)	overcurrent protective device	OCPD
240.21 (B)(1) (1) (4)	Overcurrent device	OCPD
240.21 (B) (1)(1) (4) In	Overcurrent Protection	Fine as is
240.21 (B) (2) (1)	Overcurrent device	OCPD
240.21 (B) (2) (2)	Overcurrent devices	OCPDs
240.21 (B) (3) (1)	Overcurrent device	OCPD
240.21 (B) (3) (2)	Overcurrent device	OCPD
240.21 (B) (4) (3)	Overcurrent device	OCPD
240.21 (B) (4) (4)	Overcurrent device	OCPD
240.21 (B) (4) (4)	Overcurrent devices	OCPDs
240.21 (B) (5) (2)	Overcurrent device	OCPD
240.21 (B) (5) (2)	Overcurrent devices	OCPDs
240.21 (B) (5) (3)	Overcurrent device	OCPD
240.21 (C). (X2)	Overcurrent Protection	Fine As Is
240.21 (C)(1). Title	Title change	Overcurrent Protective Device
240.21 (C) (1)	" protected by overcurrent protection "	Fine As Is
240.21 (C) (1)	Overcurrent protective device	OCPD
240.21 (C)(2)(1)(b)	Overcurrent device(s)	OCPDs

240.21 (C) (2) (1) (b)	Overcurrent device	OCPD
240.21 (C) (2) (4)	Overcurrent device	OCPD
240.21 (C) (2) (4)	Overcurrent device	OCPD
240.21 (C) (2) (4)	Overcurrent protection	Fine as is
240.21 (C) (3) (2)	Overcurrent devices	OCPDs
240.21 (C) (3) (3)	Overcurrent devices	OCPDs
240.21 (C) (4) (2)	Overcurrent device	OCPD
240.21 (C) (4) (2)	Overcurrent devices	OCPDs
240.21 (C) (4) (3)	Overcurrent device	OCPD
240.21 (C) (5)	Overcurrent Protection	Fine As Is
240.21 (C) (6) (1)	Overcurrent device	OCPD
240.21 (D)	Overcurrent devices	OCPDs
240.21 (E)	.shall be permitted to be protected against overcurrent.	"shall be permitted to have overcurrent protection"
240.21 (F)	.shall be permitted to be protected against overcurrent.	"shall be permitted to have overcurrent protection"
240.21 (H). (X2)	Overcurrent Protection	Fine As Is
240.22. (X2)	Overcurrent device	OCPD
240.24(A)	Supplementary overcurrent protection	Fine as is
240.24(A). (X4)	Overcurrent protective devices	OCPDs
240.24(B)	Overcurrent devices	OCPDs
240.24(B)(1). Title	Feeder overcurrent protective devices	Feeder OCPDs
240.24(B)(1)	Service overcurrent protective devices	Service OCPDs
240.24(B)(2). TITLE	Branch-circuit overcurrent protective device	Fine as is
240.24(B)(2).	Branch-circuit overcurrent protective device	Branch-Circuit OCPD
240.24(C)	Overcurrent protective devices	OCPDs
240.24(D)	Overcurrent protective devices	OCPDs
240.24(E)	Overcurrent protective devices	OCPDs
240.24(E)	Supplementary overcurrent protection	Fine as is
240.24(E) (X2)	Overcurrent protective devices	OCPDs
240.24(F)	Overcurrent protective devices	OCPDs
240.30(A)	Overcurrent devices	OCPDs
240.32	Overcurrent devices	OCPDs
240.33	Overcurrent devices	OCPDs
240.86	Overcurrent device	OCPD
240.86(B)	Overcurrent device	OCPD
240.86(C)	Overcurrent device	OCPD

	240.87	Overcurrent device	OCPD
	240.90.	Overcurrent protection	Fine as is
	240.91(B). (X2)	Overcurrent device	OCPD
	240.92	Overcurrent device	OCPD
	240.92(A)	be protected	shall be provided with overcurrent protection
	240.92(C)	Overcurrent protection	Fine as is
	240.92(C)(1)(1)	Overcurrent device	OCPD
	240.92(C)(1)(2)	protective devices	Fine as is
	240.92(C)(1)(3)	Overcurrent devices	OCPDs
	240.92(C)(2)(1)	Overcurrent device	OCPD
	240.92(C)(2)(2) (X3)	Overcurrent devices	OCPDs
	240.92(C)(2)(3)	Overcurrent relaying	Fine as is
	240.92(C)(2)(4)	Overcurrent device	OCPD
	240.92(D)	Overcurrent protection	Fine as is
	240.92(D)(2). (X3)	Overcurrent devices	OCPDs
	240.92(D)(4)	Overcurrent device	OCPD
	240.92(E)	Overcurrent device	OCPD
	240.92(E)	Overcurrent protection	Fine as is
10	Article 242		
	242.14(ABC)	Overcurrent device	OCPD
	242.16	Overcurrent protection	Branch-circuit OCPD
10	Article 404		
	404.5	Overcurrent Devices	OCPDs
10	Article 408		
	408.4(A)	Overcurrent device	OCPD
	408.6 (X2)	Overcurrent protection devices	OCPDs
	408.36. Title	Overcurrent protection	Fine as is
	408.36. (X2)	Overcurrent protective device	OCPD
	408.36. (X3)	Overcurrent devices	OCPDs
	408.36(A)	Overcurrent protection	Fine as is
	408.36(B)	Overcurrent protection	Fine as is
	408.36(C)	Overcurrent device	OCPD
	408.36(D)	Overcurrent protection devices	OCPDs
	408.52	Overcurrent devices	OCPDs
	408.54	Overcurrent devices	OCPDs

408.55	Overcurrent devices	OCPDs

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-11			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
11	Article 409			
	409.21. TITLE	Overcurrent Protection	Fine as is	
	409.21(A)	Overcurrent Protection	Fine as is	
	409.21(B)	Protection	Overcurrent protection	
	409.21(B)	overcurrent protective device	OCPD	
	409.21(B)	Overcurrent Protection	Fine as is	
	409.21(C). (X2)	overcurrent protective device	OCPD	
	409.104	Overcurrent Devices	OCPDs	
11	Article 430			
	430.10(A) In.	Overcurrent Device	OCPD	
	430.22(G)(1)(1)	Overcurrent Protection	Fine as is	
	430.22(G)(1)(2)	Overcurrent Protection	Fine as is	
	430.22(G)(2)(1)	Overcurrent Protection	Fine as is	
	430.22(G)(2)(2)	Overcurrent Protection	Fine as is	
	430.28	Branc-Circuit protective device	OCPD	
	430.28	Overcurrent Device	OCPD	
	430.51	Overcurrent	Fine as is	
	430.53(C)(5)	Overcurrent Protection	Fine as is	
	430.55	Overcurrent Protection	Fine as is	
	430.61	Overcurrents	Fine as is	
	430.62(A)Ex.2	Feeder Overcurrent protective device	Feeder OCDP	
	430.62(A)Ex.2	Overcurrent Protection	Fine as is	
	430.62(B)	Feeder Overcurrent protective device	Feeder OCDP	
	430.63Ex.	Feeder Overcurrent device	Feeder OCDP	
	430.63Ex.	Overcurrent Protection	Fine as is	
	430.72. Title	Overcurrent Protection	Fine as is	
	430.72(A)	protected against overcurrent	shall be provided with overcurrent protection in	
			accordance with	
	430.72(A)	Branch-circuit overcurrent protective devices	OCPDs	
	430.72(A)	protected against overcurrent	shall be provided with overcurrent protection in	
			accordance with	
	430.72(B). (X2)	Overcurrent Protection	Fine as is	
	430.72(B)	Overcurrent Device	ОСРД	

	430.72(B)	Overcurrent Protection	Fine as is
	430.72(B)(1) (X3)	Overcurrent Protection	Fine as is
	430.72(B)(2) Title	Branch-circuit overcurrent protective device	Fine as is
	430.72(B)(2) (X2)	protective devices	OCPDs
	430.72(C)Ex.	Overcurrent Protection	Fine as is
	430.72(C)(3)	Overcurrent Devices	OCPDs
	430.72(C)(4)	Overcurrent Device	OCPD
	430.72(C)(5)	Protection	Overcurrent protection
	430.87	Overcurrent Device	OCPD
	430.94. (X2)	Overcurrent Protection	Fine as is
	430.94. (X3)	Overcurrent protective device	OCPD
	430.109(A)(7)	Overcurrent protection	Fine as is
	430.109(B)	Branch-circuit overcurrent device	branch-circuit OCPD
	430.111(A). (X2)	Overcurrent Device	Fine as is
	430.112 Ex.	Branch circuit protective device	Suggest CMP to Review
	430.206. Title	Overcurrent protection	Fine as is
	430.206(B)(2)	considered to have Overcurrent	Overload
	430.206(C)	Fault-Current protection	Suggest CMP to Review
	430.207	Overcurrent (overload)Relays	Fine as is
	430.207	Overcurrent Relays	Fine as is
11	Article 440		
	440.21	Overcurrent	Fine as is
	440.21	Overcurrent Protection	Fine as is
	440.22(B)(2)Ex.	Overcurrent device	OCPD
	440.52(B)	Overcurrent	shall be provided with overcurrent protection
11	Article 460		
	460.9. Title	Overcurrent Protection	Fine As Is
	460.9. (X3)	Overcurrent Device	OCPD
	460.25	Overcurrent Protection	Fine As Is
	460.28(B)	Overcurrent Device	OCPD

	CMP-10 TG-4 Review of Ove	ercurrent Language for the Articles undeer	r the purview of CMP-12
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language
12	Article 610		
	610. Part V	Overcurrent Protection	Fine as is
	610.41(A)	Overcurrent Devices	OCPDs
	610.43(A)(1)	Branch Circuit Overcurrent Device	OCPD
	610.53 Title	Overcurrent Protection	Fine as is
	610.53	be protected from Overcurrent	shall be provided with overcurrent protection
	610.53	Overcurrent Devices	OCPDs
	610.53(B)	Branch Circuit Overcurrent Devices	OCPDs
12	Article 620		
	620.12(A)(4)	Overcurrent Protection	Fine as is
	620.22(A)(2) Title	Overcurrent protective device	Fine as is
	620.22(A)(2)	Overcurrent Device protecting	branch-circuit OCPD
	620.22(A)(2)	Overcurrent Device	OCPD
	620.22(B)	Overcurrent Device protecting	branch-circuit OCPD
	620.22(B)	Overcurrent Device	OCPD
	620.25 Title	Overcurrent Devices	Overcurrent Protective Devices
	620.25. (X2)	Overcurrent Devices	OCPDs
	620.53	Overcurrent protective device	OCPD
	620.54	Overcurrent protective device	OCPD
	620.55	Overcurrent protective device	OCPD
	Art 620 Part VII	Overcurrent Protection	Fine as is
	620.61	Overcurrent Protection	Fine as is
	620.61(A). (X2)	be protected against Overcurrent	shall be provided with overcurrent protection
	620.62(A)	Overcurrent protective devices, (OCPD)	OCPDs
	620.62(B)	OCPDs	Fine as is
	620.62(C)	OCPDs. And. Overcurrent Devices	Fine as is. And. OCPDs
	620.62	Overcurrent protective devices	OCPDs
	620.65. (X3)	Overcurrent Devices	OCPDs
12	Article 625		
	625.60(C). (X4)	Overcurrent Protection	Fine as is
12	Article 627		
	627.41	Overcurrent Protection	Fine as is
	627.41(A)	Overcurrent Protection	Fine as is

	627.41(B)	Overcurrent Devices	OCPDs
12	Article 630		
	630.12	Overcurrent Protection	Fine as is
	630.12	Overcurrent Device	OCPD
	630.12(A). (X2)	Overcurrent Protection	Fine as is
	630.12(A). (X5)	Overcurrent Device	OCPD
	630.13	Overcurrent Protection	Fine as is
	630.32	Overcurrent Protection	Fine as is
	630.32	Overcurrent Device	OCPD
12	Article 640		
	640.9(C)	Overcurrent Protection	Fine as is
	640.22	Overcurrent protection devices	OCPDs
	640.22	Overcurrent Devices	OCPDs
	640.43	Overcurrent protection devices	OCPDs
12	Article 645		
	645.27	Overcurrent protective devices, (OCPD)	OCPDs
	645.27	Overcurrent protective devices	OCPDs
12	Article 646		
	646.7. (X11)	Overcurrent Protection	Fine as is
12	Article 647		
	647.5	Overcurrent Protection	Fine as is
12	Article 650		
	650.9	Overcurrent Protection	Fine as is
	650.9	Overcurrent Device	OCPD
12	Article 660		
	660.7	Overcurrent Protection	Fine as is
	660.7(A)	Overcurrent protective devices	OCPDs
	660.7(B)	Overcurrent Devices	OCPDs
	660.7(B)	Overcurrent Protection	Fine as is
	660.9	Overcurrent Devices	OCPDs
12	Article 665		
	665.24	Overcurrent Protection	Fine as is
12	Article 668		
	668.4(C)(2)	Overcurrent Protection	Fine as is
	668.21	Overcurrent Protection	Fine as is

	668.21	Overcurrent Device	OCPD
12	Article 669		
	669.9	Overcurrent Protection	Fine as is
	669.9	be protected from Overcurrent	shall be provided with overcurrent protection
12	Article 670		
	670.1	Overcurrent Protection	Fine as is
	670.4(B). (X3)	Overcurrent Protection	Fine as is
	670.5. (X4)	Overcurrent Protection	Fine as is
	670.5(C). (X2)	Overcurrent protective device	OCPD
12	Article 685		
	685.10.	Overcurrent Devices	OCPDs

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-13			
CMP	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
13	Article 100			
	Emerg.Power Supply Systems (EPSS)	overcurrent protection devices	overcurrent protective devices (OCPDs)	
	Transfer-Switch B-C Emerg. Ltg.	branch-circuit overcurrent device	branch-circuit overcurrent protective device (OCPD)	
13	Article 130			
	130.80(C)	overcurrent devices	OCPDs	
	130.80(C)	branch-circuit overcurrent device	OCPD	
13	Article 445			
	445.11	Overcurrent protective Relay	Fine as is	
	445.12. Title	Overcurrent Protection	Fine as is	
	445.12(A)	Overcurrent protective means	Overcurrent protection means	
	445.12(B)	Overcurrent Protection	Fine as is	
	445.12(B) (X2)	Overcurrent Device	OCPD	
	445.12(C)	Overcurrent Device	OCPD	
	445.12(D)	Overcurrent Devices	OCPDs	
	445.12(E). (X3)	Overcurrent Devices	OCPDs	
	445.13(A). (X2)	Overcurrent Protection	Fine as is	
	445.13(B). Title	Overcurrent protection	Fine as is	
	445.13(B).	Overcurrent protective device	OCPD	
	445.13(B)	Overcurrent Relay	Fine as is	
13	Article 455			
	455.7	Overcurrent Protection	Fine As Is	
	455.7	protected from Overcurrent	shall be provided with overcurrent protection in	
			accordance with	
	455.7(A)	Overcurrent Protection	Fine As Is	
	455.7(B)	Overcurrent Protection	Fine As Is	
13	Article 480			
	480.4(B) IN.2	Overcurrent Protection	Fine As Is	
	480.6. (X2)	Overcurrent Protection	Fine As Is	
	480.7	Overcurrent Device	OCPD	
13	Article 695			
	695.4(C)	Overcurrent protective devices	OCPDs	
	695.4(H). Title	Overcurrent Device Selection	Overcurrent Protective Device Selection	
	695.4(H)	Overcurrent Devices	OCPDs	

	695.5	Overcurrent Device	OCPD
	695.5	Overcurrent protective devices	OCPDs
	695.5	Overcurrent Protection	Fine as is
	695.6	Overcurrent protective devices	OCPDs
	695.6	Overcurrent Devices	OCPD
	695.6	Overcurrent Protection	Fine as is
	695.7(A)(2)	Overcurrent Devices	OCPDs
	695.7	Overcurrent Protection	Fine as is
13	Article 700		
	700.4(F)(8)	Overcurrent protective devices, (OCPD)	OCPDs
	700.6(E)	Overcurrent protective device	OCPD
	700.10(B). (X6)	Overcurrent Protection	Fine as is
	700.10(B)(6)(b)(ii)	Overcurrent protective device	OCPD
	700.10(B)(6)(e)	Overcurrent protective devices	OCPDs
	Art. 700 Part VI	Overcurrent Protection	Fine as is
	700.30.	Branch-circuit overcurrent devices	OCPDs
	700.32(A)	Overcurrent protective devices, (OCPDs)	OCPDs
	700.32(A) In	Overcurrent Protection	Fine as is
	700.32(C)	Overcurrent Devices	OCPDs
13	Article 701		
	701.6(C)	Overcurrent protective device	OCPD
	701.10(B)(1). (X5)	Overcurrent Protection	Fine as is
	701.10(B)(1)	Overcurrent protective device	OCPD
	Art. 701. Part IV	Overcurrent Protection	OCPDs
	701.30.	Branch-Circuit Overcurrent devices	Branch-Circuit OCPDs
	701.32(A). (X2)	Overcurrent protective devices, OCPDs	OCPDs
	701.32(B). (X3)	OCPDs	Fine as is
	701.32(C). (X2)	OCPDs	Fine as is
	701.32(C)Ex	Overcurrent Devices	OCPDs
	701.32(C) In 2	OCPD and OCPDs	Fine as is
13	Article 702		
	702.5(C)	Overcurrent protective device	OCPD
13	Article 706		
	706.15(E)(1)	Overcurrent Device	OCPD
	706.30(B)	Overcurrent Devices	OCPDs

	706.31 Title	Overcurrent Protection	Fine as is
	706.31(A)	shall be protected at the source from overcurrent.	shall be provided with overcurrent protection at the
			source
	706.31(A)	shall be protected from overcurrent.	shall be provided with overcurrent protection
	706.31(A) In	Overcurrent Device	OCPD
	706.31(B). Title	Overcurrent Device	Overcurrent Protective Device
	706.31(B)	Overcurrent protective devices	OCPDs
	706.31(B)	Overcurrent devices	OCPDs
	706.31(C)	Overcurrent protective devices	OCPDs
	706.31(E)	Overcurrent Protection	Fine as is
	706.33(B)(2)	Overcurrent Device	OCPD
13	Article 708		
	708.10(B)	Overcurrent Protection	Fine as is
	708.24(E)	Overcurrent protective device	OCPD
	Art. 708. Part IV	Overcurrent Protection	Fine as is
	708.50.	Feeder- and Branch-circuit overcurrent devices	Feeder- and Branch-circuit OCPDs
	708.52(B)	Overcurrent Devices	OCPDs
	708.54(A)	Overcurrent protective devices, (OCPD)	OCPDs
	708.54(A). (B). (C)	OCPDs	Fine as is
	708.54	Overcurrent Devices	OCPDs

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-14			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
14	Article 500			
	500.30(A)(2)	Branch Circuit Overcurrent Protection	OCPD	
	500.30.	Overcurrent Protection	Fine as is	
14	Article 501			
	501.105(B)(5)	Overcurrent Protection	Fine as is	
	501.125(B)(2)	Motor Overcurrent	Fine as is	
14	Article 502			
	502.120(A)	Overcurrent Devices	OCPDs	
	502.120(B)(1)	Overcurrent Devices	OCPDs	
	502.125	Motor Overcurrent	Fine as is	
14	Article 505			
	505.30(A)(2)	Branch Circuit Overcurrent Protection	OCPD	
	505.30.	Overcurrent Protection	Fine as is	
14	Article 506			
	506.30.	Branch Circuit Overcurrent Protection	OCPD	
	506.30.	Overcurrent Protection	Fine as is	

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-15		
CMP	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language
15	Article 100		
	Bull Switch	Overcurrent protection	Fine as is
15	Article 517		
	517.17(B)	Overcurrent protective devices	OCPDs
	517.31(G). (X5)	Overcurrent protective devices	OCPDs
	517.31(G)	Overcurrent	Fine as is
	517.33((C). (X5)	Overcurrent protective devices	OCPDs
	517.42(F)	Overcurrent protective devices	OCPDs
	517.42(F)	Overcurrent	Fine as is
	517.73	Overcurrent Protection	Fine as is
	517.73(A)	Overcurrent protective devices	OCPDs
	517.73(B)	Overcurrent protective devices	OCPDs
	517.73(B)	Overcurrent Protection	Fine as is
	517.74(B)	Overcurrent protective devices	OCPDs
	517.160(A)(2)	Overcurrent Protection	Fine as is
	517.160(A)(2)	Overcurrent protective device	OCPD
	517.160(A)(2)	be protected against Overcurrent	be provided with overcurrent protection
	517.160(A)(3)	Overcurrent protective devices	OCPDs
	517.160(B)(1)	Overcurrent protective devices	OCPDs
15	Article 518		
	518.7(A)(1)	Overcurrent Protection	Fine as is
	518.17(A)(1) and (2)	Overcurrent Devices	OCPDs
15	Article 520		
	520.9	Branch Circuit Overcurrent Device	OCPD
	520.21	Overcurrent protective devices	OCPDs
	520.25. (X3)	Overcurrent Protection	Fine as is
	520.26	Overcurrent protective devices	OCPD
	520.26. (X3)	Overcurrent Protection	Fine as is
	520.27. (X2)	Overcurrent Device	OCPD
	520.44-T	Overcurrent Devices	OCPD
	520.50(C)	Overcurrent Protection	Fine as is
	520.50.	Branch-circuit overcurrent protective device	OCPDs
	520.52	Overcurrent Protection	Fine as is

	520.53(A)	Overcurrent protective devices	OCPDs
	520.53(D)	Overcurrent Protection	Fine as is
	520.54	Overcurrent Devices	OCPDs
	520.54(D)	Overcurrent Device	OCPD
	520.54(D)(1) and (2)	Overcurrent protective devices	OCPD
	520.54(E)	Overcurrent protective device	OCPD
	520.54(E). (X4)	Overcurrent protection device	OCPD
	520.54(E)	Overcurrent Devices	OCPDs
	520.54(K)	Overcurrent Device	OCPD
	520.68	Overcurrent protective device	OCPD
	520.68(3)	Overcurrent Device	OCPD
	520.68(4)	Overcurrent protective device	OCPD
	520.68(6)	Overcurrent Devices	OCPDs
	520.68(C)	Overcurrent Protection	Fine as is
15	Article 522		
	522.10(A)(2). (X3)	Overcurrent Devices	OCPDs
	522.10(A)(2	Overcurrent protective device	OCPD
	522.10(B). (X4)	Overcurrent Devices	OCPDs
	522.23. (X3)	Overcurrent Protection	Fine as is
15	Article 525		
	525.12	Overcurrent Device	OCPD
	525.23(B)	Overcurrent Device	OCPD
	525.23(C). (X2)	Overcurrent Protection	Fine as is
15	Article 530		
	530.9(A)	Branch-circuit overcurrent device	Branch-circuit OCPD
	530.10(C)	Overcurrent Protection	Fine as is
	530.23 and (A)	Overcurrent Protection	Fine as is
	530.23(B)	Overcurrent protective devices	OCPDs
	530.23(D)	Overcurrent Protection	Fine as is
	530.42	Overcurrent Protection	Fine as is
15	Article 540		
	540.11(B)	Overcurrent Devices	OCPDs

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-16			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
16	Article 830			
	830.15. (X4)	Overcurrent Protection	Fine as is	
	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-17			
-----	--	--	---	--
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
17	Article 422			
	422.5(C)	Branch-circuit overcurrent protective device	Branch-Circuit OCPD	
	422.11. Title	Overcurrent Protection	Fine as is	
	422.11	protected against overcurrent	shall be provided with overcurrent protection	
	422.11(A)	Overcurrent Protection	Fine as is	
	422.11(A)	Branch-circuit overcurrent protective device	Branch-Circuit OCPD	
	422.11(B)	Overcurrent Protection	OCPDs	
	422.11(C)	Overcurrent Protection	OCPDs	
	422.11(D)	Overcurrent protective devices	OCPDs	
	422.11(E)	Overcurrent Protection	Fine as is	
	422.11(E)(1)	Overcurrent Protection	Fine as is	
	422.11(E)(2)	Overcurrent Protection	Fine as is	
	422.11(E)(3)	Overcurrent Protection	OCPD	
	422.11(E)(3)	Overcurrent Device	OCPD	
	422.11(F)(1)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs	
	422.11(F)(1)	Overcurrent Protective Devices	OCPDs	
	422.11(G)	Overcurrent Protective Devices	OCPDs	
	422.13	Overcurrent Protection	Fine as is	
	422.31(A)	Branch-circuit overcurrent protective device	Branch-Circuit OCPD	
	422.60(A)	Overcurrent Protection	Fine as is	
	422.62(B)(1). (X2)	Overcurrent protective device	OCPD	
17	Article 424			
	424.19	Supplementary Overcurrent Protective Devices	Supplementary OCPDs	
	424.19(A)	Supplementary Overcurrent Protection	Fine as is	
	424.19(A)	Supplementary Overcurrent Protection	Fine as is	
	424.19(A)	Supplementary Overcurrent Protective Device(s)	Supplementary OCPDs	
	424.19(B)	Supplementary Overcurrent Protection	Fine as is	
	424.22	Overcurrent Protection	Fine as is	
	424.22(A)	Overcurrent Protection	Fine as is	
	424.22(A)	protected against overcurrent	"shall be permitted to have overcurrent protection"	
	424.22(B)	Supplementary Overcurrent Protective Device	Supplementary OCPD	
	424.22(C). Title	Overcurrent Protective Devices	Fine as is	
I T	424.22(C)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs	

424.22	(C)	Overcurrent Protection	Fine as is
424.22	(C)	Supplementary Overcurrent Protection	Fine as is
424.22(D)	(X2)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
424.22(E).	(X3)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
424.72	2	Overcurrent Protection	Fine as is
424.72	(A)	Overcurrent protective device	OCPD
424.72	(B)	Overcurrent protective device	OCPD
424.72(C).	Title	Supplementary Overcurrent Protective Devices	Fine as is
424.72	(C)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
424.72	(C)	Overcurrent Protection	Fine as is
424.72(D).	Title	Supplementary Overcurrent Protective Devices	Fine as is
424.72(D).	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
424.72	(D)	Overcurrent protective device	OCPD
424.72	(E)	Supplementary Overcurrent Protective Devices. (X3)	Supplementary OCPDs
424.82	2	Overcurrent protective devices	OCPDs
17 Article 4	25		
425.19	Ð	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
425.19(A).	. (X2)	Supplementary Overcurrent Protection	Fine as is
425.19	(A)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
425.19	(B)	Supplementary Overcurrent Protection	Fine as is
425.22.1	Title	Overcurrent Protection	Fine as is
425.22	(A)	Overcurrent Protection	Fine as is
425.22	(A)	protected against overcurrent	"shall be permitted to have overcurrent protection"
425.22	(B)	Supplementary Overcurrent Protective Device	Supplementary OCPD
425.22(C).	Title	Overcurrent Protective Devices	Fine as is
425.22	(C)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
425.22(C).	. (X2)	Supplementary Overcurrent Protection	Fine as is
425.22(D).	Title	Supplementary Overcurrent Protective Devices	Fine as is
425.22(D).	. (X2)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
425.22(E)	(X3)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
425.72	2	Overcurrent Protection	Fine as is
425.72	(A)	Overcurrent protective device	OCPD
425.72	(B)	Overcurrent protective device	OCPD
425.72(C).	Title	Supplementary Overcurrent Protective Devices	Fine as is
425.72	(C)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs

	425.72(C)	Overcurrent Protection	Fine as is
	425.72(D)	Overcurrent protection	Fine as is
	425.72(E). Title	Supplementary Overcurrent Protective Devices	Fine as is
	425.72(E)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
	425.72(E)	Overcurrent Protective Devices	OCPD
	425.72(F). (X3)	Supplementary Overcurrent Protective Devices	Supplementary OCPDs
	425.82	Overcurrent protective devices	OCPDs
17	Article 427		
	427.57	Overcurrent Protection	Fine as is
	427.57	considered protected against Overcurrent	considered to have overcurrent protection
17	Article 680		
	680.10.(A)& (B)(2)	Overcurrent protective devices	OCPDs
	680.23(F)(2)	Overcurrent Protection	Fine as is

	CMP-10 TG-4 Review of Overcurrent Language for the Articles undeer the purview of CMP-18			
СМР	NEC Section (using First Draft of 2026 NEC)	Current Language	"New" Language	
18	Article 393			
	393.45. Title	Overcurrent Protection	Overcurrent Protection	
	393.45(A)	Overcurrent Protection	Fine as is	
18	Article 406			
	406.46(F)	Overcurrent Device	OCPD	
18	Article 410			
	410.59(A)	Branch-circuit overcurrent devices	Branch-Circuit OCPD	
	410.153	Overcurrent Protection	Fine as is	
18	Article 600			
	600.41	Overcurrent	CMP to Review	

Public Comment No. 504-NFPA 70-2024 [Global Input]		
The Corr Article40 100 force	elating Committee d 6 (Wiring Devices) a prrelation of existing	lirects the CMPs to review the revision of the title of and the new definition for the term "wiring device" in Article a terminology using the newly define term in their articles.
Additional Pro	posed Changes	
File Name CN_157.pdf	Description	Approved
Statement of	Problem and Sub	estantiation for Public Comment
NOTE: The fo	ollowing CC Note No.	157 appeared in the First Draft Report on First Revision No. 7965.
The Correlati (Wiring Devic correlation of	ng Committee directs es) and the new defir existing terminology	the CMPs to review the revision of the title of Article 406 nition for the term "wiring device" in Article 100 for using the newly define term in their articles.
	Related	ltem
 First Revision 	on No. 7965	
Submitter Info	ormation Verification	tion
Submitter Fu	III Name: CC Notes	
Organizatior	NEC Correl	ating Committee
Street Addre	SS:	
City: State:		
Zip:		
Submittal Da	te: Tue Jul 30 2	22:29:14 EDT 2024
Committee:	NEC-P18	
Committee St	atement	
Committee Action:	Rejected	
Resolution:	The title "Wiring Devidentified and selected covered under the re- snap switches and re- cord connectors, flar connectors, dimmers development of the re- Public Comment 504 reviewed for correlat is consistent with the	vices" and subsequent revisions referring to "wiring devices" was ed as an inclusive means to identify all other types of products evised scope of Article 406. The suggested change merely identifie eceptacles, and over looks other devices such as attachment plugs nged surface devices, including both inlets and outlets, single-pole s and electronic control switches. This change also supports the new NEC format by capturing legacy devices under one article. 4 and Correlating Committee Note 157 The Title of Article 406 was tion with the definition of "Wiring Devices" and the revisions in SR2 e title.

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Submitter Information Verification

Committee: NEC-AAC

Submittal Date: Thu May 09 08:59:03 EDT 2024

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the CMPs to review the revision of the title of Article 406 (Wiring Devices) and the new definition for the term "wiring device" in Article 100 for correlation of existing terminology using the newly define term in their articles.

First Revision No. 7965-NFPA 70-2024 [New Definition after Definition: Wireways, Nonmetallic. (No...]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S.

Bowmer, Trevor N.

- Hickman, Palmer L.
- Holub, Richard A.
- Jackson, Peter D.
- Kendall, David H.

Manche, Alan

Osborne, Robert D.

Porter, Christine T.

Schultheis, Timothy James

Williams, David A.

Public Comment No. 480-NFPA 70-2024 [Definition: Busbar (as applied to low-voltage suspended cei...] Busbar (as applied to low-voltage suspended ceiling power distribution systems). A noninsulated conductor electrically connected to the source of supply and physically supported on an insulator providing a power rail for connection to utilization equipment, such as sensors, actuators, A/V devices, low-voltage luminaire assemblies, and similar electrical equipment. (393) (CMP-18) Additional Proposed Changes File Name **Description Approved** CN 127.pdf Statement of Problem and Substantiation for Public Comment NOTE: The following CC Note No. 127 appeared in the First Draft Report on First Revision No. 8123. The Correlating Committee directs CMP-18 to review the definition of "Busbar" and consider removing "(as applied to low-voltage suspended ceiling power distribution systems)" to comply with the NEC Style Manual 2.1.2.6.2 where the defined term is used in only one article. **Related Item** First Revision No. 8123 Submitter Information Verification Submitter Full Name: CC Notes Organization: **NEC Correlating Committee** Street Address: Citv: State:

Zip:

Submittal Date:Tue Jul 30 19:36:49 EDT 2024Committee:NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8038-NFPA 70-2024</u>
Statement:	The additional text "applies to low-voltage suspended ceiling power distribution systems" was removed from the title of the definition of Busbar and placed into the definition to comply the Section 2.1.2.6.2 of the NEC Style Manual.

Correlating Committee Note No. 127-NFPA 70-2024 [Definition: Busbar (as

applied to low-voltage suspended cei...]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Wed May 08 15:03:59 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs CMP-18 to review the definition of "Busbar" and consider removing "(as applied to low-voltage suspended ceiling power distribution systems)" to comply with the NEC Style Manual 2.1.2.6.2 where the defined term is used in only one article.

First Revision No. 8123-NFPA 70-2024 [Definition: Busbar.]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Comment No. 481-NFPA 70-2024 [Definition: Busbar Support (as				
NFPA applied to low-	NFPA applied to low-voltage suspe]			
Busbar Sussers).	Busbar Support (as applied to low-voltage suspended ceiling power distribution			
An insulato support and	r that runs the length of a section of suspended ceiling bus rail that serves to d isolate the busbars from the suspended grid rail. (393) (CMP-18)			
Additional Prop	bosed Changes			
File Name CN_128.pdf	Description Approved			
Statement of P	roblem and Substantiation for Public Comment			
NOTE: The foll	owing CC Note No. 128 appeared in the First Draft Report on First Revision No. 8131.			
The Correlating Support" and c systems)" to co defined term is	The Correlating Committee directs CMP-18 to review the definition of "Busbar Support" and consider removing "(as applied to low-voltage suspended ceiling power distribution systems)" to comply with the NEC Style Manual 2.1.2.6.2 where the defined term is used in only one article.			
	Related Item			
• First Revision	• First Revision No. 8131			
Submitter Information Verification				
Submitter Full	Name: CC Notes			
Organization:	NEC Correlating Committee			
Street Address	s:			
City: State:				
Zip:				
Submittal Date	e: Tue Jul 30 19:38:24 EDT 2024			
Committee:	NEC-P18			
Committee Statement				
Committee Action:	Rejected but see related SR			
Resolution:	<u>SR-8040-NFPA 70-2024</u>			
Statement:	The additional text "applies to low-voltage suspended ceiling power distribution systems" was removed from the title of the definition of Busbar Support and placed into the definition to comply the Section 2.1.2.6.2 of the NEC Style Manual.			

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Correlating Committee Note No. 128-NFPA 70-2024 [Definition: Busbar

Support (as applied to low-voltage suspe...]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Wed May 08 15:05:22 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs CMP-18 to review the definition of "Busbar Support" and consider removing "(as applied to low-voltage suspended ceiling power distribution systems)" to comply with the NEC Style Manual 2.1.2.6.2 where the defined term is used in only one article.

First Revision No. 8131-NFPA 70-2024 [Definition: Busbar Support.]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.



Lighting Outlet.

An outlet intended for the direct connection of <u>The point where the branch circuit conductors</u> are connected to or are intended to be connected to a lampholder or luminaire. (CMP-18)

Statement of Problem and Substantiation for Public Comment

The panel resolved PI 3140 with the statement that the existing definition is clear. I don't agree, based on many discussions on various social media platforms that the current definition is as clear a it should be. The outlet, no matter what type it is, is the point where the branch circuit conductors end and supply power to a receptacle, lampholder, luminaire, or other utilization equipment.

CMP 18 accepted a similar PI for the definition of receptacle outlet to provided needed clarity.

Related Item

• ublic Input No. 3140-NFPA 70-2023

Submitter Information Verification

Submitter Full Name: Don Ganiere	
Organization:	none
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat Aug 24 12:32:19 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected
Resolution:	The suggested language does not improve the definition. Outlet is defined in the code already and redefining it in this definition would make it redundant.

Public Comm	nent No. 2080-NFPA 70-2024 [Definition: Lighting Outlet.]		
Lighting Outle	t.		
An outlet intend outlet. If luminai outlet. (CMP-18	An outlet intended for the direct connection of a lampholder or luminaire. <u>The ceiling box is the outlet.</u> If luminaire is direct wired from from switch (disconnecting means) the device box is the <u>outlet.</u> (CMP-18)		
Statement of Prob	lem and Substantiation for Public Comment		
The new sentences	s provide direction on where the outlet is located.		
• PI #3140	ltem		
Submitter Information	tion Verification		
Submitter Full Nar	ne: James Stallcup		
Organization:	Stallcup Electrical Education		
Affiliation:	Stallcup Electrical Education		
Street Address:			
City:			
State:			
Zip:			
Submittal Date:	Wed Aug 28 18:29:52 EDT 2024		
Committee:	NEC-P18		
Committee Statem	ent		
Committee Action	: Rejected		
Resolution:	A lighting outlet is not always ceiling mounted or controlled by a switch.		

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NFPA	Public Comment No. 492-NFPA 70-2024 [Definition: Luminaire.]
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Luminaire.

Utilization equipment intended to illuminate a space or object(s), to facilitate visual tasks, activities, aesthetics, or security, or a similar purpose. Light-emitting devices such as lamps or LED modules could be removable or replaceable. The equipment can connect directly to the branch circuit (ac or dc) or be used with a separate power source that regulates the voltage, current, or both from the branch circuit. A lampholder itself is not a luminaire. (CMP-18)

Additional Proposed Changes

File Name Description Approved

CN_139.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 139 appeared in the First Draft Report on First Revision No. 8014.

The Correlating Committee directs CMP-18 to review the definition "luminaire" and remove the last sentence to comply with the NEC Style Manual 2.1.2.5. The panel could consider adding a definition for lampholder.

Related Item

• First Revision No. 8014

Submitter Information Verification

Submitter Full Name: CC Notes		
Organization:	NEC Correlating Committee	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Tue Jul 30 19:57:52 EDT 2024	
Committee:	NEC-P18	

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7956-NFPA 70-2024</u>
Statement:	Removed last sentence to comply with the NEC Style Manual 2.1.2.5.

Correlating Committee Note No. 139-NFPA 70-2024 [Definition: Luminaire.]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Wed May 08 15:52:01 EDT 2024

Committee Statement

Committee The Correlating Committee directs CMP-18 to review the definition "luminaire" and remove the last sentence to comply with the NEC Style Manual 2.1.2.5. The panel could consider adding a definition for lampholder.

First Revision No. 8014-NFPA 70-2024 [Definition: Luminaire.]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.



Correlating Committee Note No. 146-NFPA 70-2024 [Definition: Portable NFPA Handlamp.]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Wed May 08 17:04:41 EDT 2024

Committee Statement

Committee The Correlating Committee directs CMP-18 to review the definition "Portable Handlamp" and consider deletion, since this is a commonly used term and does not need to be defined in the Code.

FR-8016 is referred to CMP 14 for information and correlation with the hazardous location requirements in 511.4(B)(2), as referenced in PI 2297. There may be no action required, but a definition of portable handlamp has been added to Article 100 and it is referred to CMP14 for information as the hazardous location articles have specific requirements for portable handlamps.

First Revision No. 8016-NFPA 70-2024 [New Definition after Definition: Portable (as applied to eq...]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

- Ayer, Lawrence S.
- Bowmer, Trevor N.
- Hickman, Palmer L.
- Holub, Richard A.
- Jackson, Peter D.
- Kendall, David H.
- Manche, Alan
- Osborne, Robert D.

Porter, Christine T. Schultheis, Timothy James Williams, David A. Public Comment No. 500-NFPA 70-2024 [Definition: Power Supply (as applied NFPA to low-voltage suspend...]

Power Supply (as applied to low-voltage suspended ceiling power distribution systems).

A Class 2 power supply connected between the branch-circuit power distribution system and the busbar low-voltage suspended ceiling power distribution system. (393) (CMP-18)

Additional Proposed Changes

File Name Description Approved

CN_150.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 150 appeared in the First Draft Report on First Revision No. 8134.

The Correlating Committee directs CMP-18 to review the definition "Power Supply" and delete (as applied to ...) this is not necessary since the article number following the defined term indicates the term only applies to Article 393.

Related Item

First Revision No. 8134

Submitter Information Verification

Submitter Full Name	CC Notes
Organization:	NEC Correlating Committee
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Jul 30 20:27:34 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8041-NFPA 70-2024</u>
Statement:	The additional text "applies to low-voltage suspended ceiling power distribution systems" was removed from the title of the definition of Power Supply and placed into the definition to comply the Section 2.1.2.6.2 of the NEC Style Manual.

Correlating Committee Note No. 150-NFPA 70-2024 [Definition: Power Supply

(as applied to low-voltage suspend...]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Thu May 09 08:04:47 EDT 2024

Committee Statement

Committee The Correlating Committee directs CMP-18 to review the definition "Power Supply" and delete (as applied to ...) this is not necessary since the article number following the defined term indicates the term only applies to Article 393.

First Revision No. 8134-NFPA 70-2024 [Definition: Power Supply.]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Com	nment No. 2078-NFPA 70-2024 [Definition: Receptacle Outlet.]
Receptacle	Outlet.
An outlet whe device box is	ere the branch-circuit conductors are connected to one or more receptacles. <u>The</u> <u>receptacle outlet.</u> (CMP-18)
Statement of Pro	oblem and Substantiation for Public Comment
The new sentend	ce provide clarity on where the location of the outlet is located.
• FR #7963	ited Item
Submitter Inform	nation Verification
Submitter Full N	Name: James Stallcup
Organization:	Stallcup Electrical Education
Affiliation:	Stallcup Electrical Education
Street Address:	
City:	
State: Zin:	
Submittal Date:	Wed Aug 28 18:21:20 EDT 2024
Committee:	NEC-P18
Committee Statement	
Committee Action:	Rejected
Resolution:	The proposed change does not improve or provide clarity. It can be misinterpreted that all device boxes are receptacle outlets.

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Wiring De	evice.
An electric a control d	al device that serves as either a connection point to facilitate the flow of current or as evice in general distribution and branch circuits. (CMP-18)
Infor gene cont	mational Note:- Examples of wiring devices include attachment plugs, receptacles, eral-use snap switches, pendant switches, surface switches, dimmers, and electronic rol switches and lighting control switches.
atement of F	Problem and Substantiation for Public Comment
This definition falls within the photocells, kn	is so broad that nearly anything (excluding utilization equipment) connected to a wire definition. Wire connectors, overcurrent devices, panelboards, motor controllers, ife switches, the examples are nearly endless.
<u>Re</u>	lated Item
• FR 7965	
bmitter Info	rmation Verification
bmitter Info Submitter Fu	rmation Verification
bmitter Info Submitter Fu Organization	rmation Verification Il Name: Ryan Jackson : Self-employed
bmitter Info Submitter Fu Organization Street Addres City:	rmation Verification II Name: Ryan Jackson : Self-employed ss:
bmitter Info Submitter Fu Organization Street Addres City: State:	rmation Verification II Name: Ryan Jackson : Self-employed ss:
bmitter Info Submitter Fu Organization Street Addres City: State: Zip:	rmation Verification II Name: Ryan Jackson : Self-employed SS:
bmitter Info Submitter Fu Organization Street Addres City: State: Zip: Submittal Da	rmation Verification II Name: Ryan Jackson : Self-employed ss: te: Sat Aug 17 19:02:00 EDT 2024 NEC D18
bmitter Info Submitter Fu Organization Street Addres City: State: Zip: Submittal Da Committee:	rmation Verification II Name: Ryan Jackson : Self-employed ss: te: Sat Aug 17 19:02:00 EDT 2024 NEC-P18
bmitter Info Submitter Fu Organization Street Addres City: State: Zip: Submittal Da Committee: mmittee Sta	rmation Verification II Name: Ryan Jackson : Self-employed ss: te: Sat Aug 17 19:02:00 EDT 2024 NEC-P18 atement
bmitter Info Submitter Fu Organization Street Addres City: State: Zip: Submittal Da Committee State: Committee Sta	rmation Verification II Name: Ryan Jackson : Self-employed ss: te: Sat Aug 17 19:02:00 EDT 2024 NEC-P18 tement Rejected

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Wiring Device.

An electrical device <u>with a yoke or used with flexible cord or cabe</u>, that serves as either a connection point to facilitate the flow of current or as a control device in general distribution and branch circuits. (CMP-18)

Informational Note: Examples of wiring devices include attachment plugs, receptacles, general-use snap switches, pendant switches, surface switches, dimmers, and electronic control switches and lighting control switches.

Statement of Problem and Substantiation for Public Comment

On behalf of the Correlating Committee, a Task Group consisting of Panel Members from both Panels 10 and 18 (Chuck Kurten, Frank Tse, Rob Roettgers, Doug Smith, Bob Fahey and Nathan Philips) were asked to ensure the reorganized Article 404 for Switches and Article 406 for Wiring Devices are correlated.

Wiring Device definition has been revised to include "with a yoke" for clarity and consistency with the definition of yoke(strap). A yoke (strap) is the structural fame of a wiring device. "Or used with flexible cord or cable" was added to address attachment plugs, cord connectors and pendant switches which do not have a yoke.

Related Item

CC note 10

Submitter Information Verification

Submitter Full Nam	e: Charles Kurten
Organization:	UL Solutions
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Wed Jul 31 11:06:46 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7879-NFPA 70-2024</u>
Statement:	Wiring Device definition has been revised to include "with a yoke" for clarity and consistency with the definition of yoke(strap). A yoke (strap) is the structural frame of a wiring device. "Or used with flexible cord or cable" was added to address attachment plugs, cord connectors and pendant switches, which do not have a yoke.

Public Comment No. 1119-NFPA 70-2024 [New Definition after Definition: NFPA Motor Fuel Dispensing Faci...]

Multifunction Platform.

An electronic assembly with multiple integral functions. The assembly connects to a lighting outlet and provides for power connection and mechanical support for optional external utilization equipment. (CMP 18).

Informational Note: Examples of integral functions include routers, environmental sensing, occupancy detection, lighting control, and audio.

Statement of Problem and Substantiation for Public Comment

This new definition is needed to correlate with the proposed new Article 420. Multifunction platforms are a new technology that is not currently addressed in the NEC. It is a single assembly of components; some are covered in the NEC and others are not. These platforms are electronic utilization equipment that can include routers and various detection devices. These platforms may supply electrical loads and weight loads for outlet boxes that need to be contemplated in the selection and installation of boxes, supporting framework and other aspects based on the weight load.

Relationship

Related Public Comments for This Document

Related CommentPublic Comment No. 1118-NFPA 70-2024 [New Section after 411.8]Public Comment No. 1118-NFPA 70-2024 [New Section after 411.8]Related Item• PI 2480 • PI 4324

Submitter Information Verification

Submitter Full Name:	Mark Earley
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Submittal Date:	Thu Aug 15 11:12:44 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:RejectedResolution:The term not used in NEC or any proposed revisions and cannot be added.

Public Com	ment No. 408-NFPA 70-2024 [Section No. 393.14(A)]
(A) General	Requirements.
All componer by qualified p and conducto by the buildin cables shall b securement a	Its of low-voltage suspended ceiling power distribution systems shall be installed ersons and in accordance with the manufacturer's installation instructions. Cables ors installed exposed on the surfaces of ceilings and sidewalls shall be supported of structure such that cables are not damaged by normal building use. Such be supported by straps, staples, hangers, cable ties listed and identified for and support, or similar fittings designed and installed to not damage the cable.
Additional Propo	esed Changes
File Name CN_51.pdf	Description Approved
Statement of Pro	blem and Substantiation for Public Comment
NOTE: The follow	ving CC Note No. 51 appeared in the First Draft Report on First Revision No. 8236.
The Correlating (the statement "in requirement in 11	Committee directs that CMP 18 review FR 8236 and reconsider the need for including accordance with the manufacturer's installation instructions" as this is a general 10.3.
	Related Item
• FIRST REVISION N	10. 8236
Submitter Inform	ation Verification
Submitter Full N	ame: CC Notes
Organization: Street Address: City: State:	NEC Correlating Committee
Zip: Submittal Date:	Tue Jul 30 15:35:04 EDT 2024
Committee:	NEC-P18
Committee State	ment
Committee	Rejected but see related SR
Resolution:	SR-8036-NFPA 70-2024
Statement:	The redundant text "to be installed" does not conform to sections 3.1.1, 3.1.2, and 3.5.1.1 of the NEC Style Manual and was removed .

Correlating Committee Note No. 51-NFPA 70-2024 [Section No. 393.14(A)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:02:54 EDT 2024

Committee Statement

Committee The Correlating Committee directs that CMP 18 review FR 8236 and reconsider the need for including the statement "in accordance with the manufacturer's installation instructions" as this is a general requirement in 110.3.

First Revision No. 8236-NFPA 70-2024 [Section No. 393.14(A)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.



Article 406 Wiring Devices Article 406 Snap Switches and Receptacles

Part I. General

406.1 Scope.

This article covers the rating, type, and installation of wiring devices <u>snap switches and</u> <u>receptacles</u>.

406.2 Listing Requirements.

Wiring devices <u>Snap switches and receptacles</u> shall be listed.

406.3 Reconditioned Equipment.

Reconditioned wiring devices snap switches and receptacles shall not be permitted to be installed.

406.9 Wiring Devices <u>9</u> Snap Switches and Receptacles in Damp or Wet Locations.

(A) Damp Locations.

(1) Receptacles.

(a) *General*.Installations suitable for wet locations shall also be considered suitable for damp locations. Receptacles shall be considered to be in locations protected from the weather where located under roofed open porches, canopies, marquees, and similar and will not be subjected to beating rain or water runoff.

(b) *Weatherproof Enclosures.* Receptacles installed outdoors in locations protected from the weather or in other damp locations shall have enclosures and covers for the receptacles that are weatherproof when the receptacles are covered (attachment plug caps not inserted and receptacle covers closed).

(c) *Weather-Resistant Receptacle Type.* All 125- and 250-volt nonlocking receptacles shall be listed weather-resistant type.

(d) *Covers*. Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the covers are not designed to open 90 degrees from the closed to open position, after installation.

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, for the types of receptacles covered by this requirement.

(2)-__<u>Snap</u> Switches.

Snap_Switches installed in damp locations shall comply with the following:

- (1) Surface-mounted <u>snap</u> switches shall be enclosed in weatherproof enclosures that comply with 312.2.
- (2) Flush-mounted <u>snap</u> switches shall be equipped with weatherproof covers.
- (B) Wet Locations.
- (1) Receptacles of 15 Amperes and 20 Amperes in a Wet Location.
- (a) Weatherproof Enclosure.

Receptacles of 15 amperes and 20 amperes, 125 volts and 250 volts installed in a wet location shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted.

(b) Outlet Box Hood.

An outlet box hood shall be identified as extra-duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood need not be identified as extra duty.

(c) Covers.

Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the cover is not designed to open 90 degrees from the closed to open position, after installation.

Informational Note: See ANSI/UL 514D–2016, *Cover Plates for Flush-Mounted Wiring Devices*, for extra-duty outlet box hoods. Extra duty identification and requirements are not applicable to listed receptacles, faceplates, outlet boxes, enclosures, or assemblies that are identified as either being suitable for wet locations or rated as one of the outdoor enclosure–type numbers of Table 110.28 that does not utilize an outlet box hood.

Exception: 15- and 20-ampere, 125- through 250-volt receptacles installed in a wet location and subject to routine high-pressure spray washing shall be permitted to have an enclosure that is weatherproof when the attachment plug is removed.

(d) Weather-Resistant Receptacle Type

All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles shall be listed and so identified as the weather-resistant type.

Informational Note: See ANSI/NEMA WD 6–2016, *Wiring Devices — Dimensional Specifications*, for receptacle configurations. The configuration of weather-resistant receptacles covered by this requirement are identified as 5-15, 5-20, 6-15, and 6-20.

(2) Other Receptacles.

All other receptacles installed in wet locations shall be listed weather-resistant type and be installed in accordance with 406.9(B)(2)(a) or 406.9(B)(2)(b).

(a) For supplying a product that is unattended while in use, the receptacle shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed.

(b) For supplying a product that is attended while in use (e.g., portable tools), the receptacle shall have an enclosure that is weatherproof when the attachment plug is removed.

(3)-<u>Snap</u> Switches.

Snap_Switches installed in wet locations shall comply with the following:

- (1) Surface-mounted switches shall be enclosed in weatherproof enclosures that comply with 312.2.
- (2) Flush-mounted switches shall be equipped with weatherproof covers.
- (C) Wiring Devices in Bathtub and Shower Spaces.

(1) Receptacles.

Receptacles shall not be installed inside of tubs or showers or within the following zones:

- (1) <u>Horizontal zone, measured 900 mm (3 ft) horizontally from any outside edge of the bathtub or shower stall, including the space outside the bathtub or shower stall space below the zone</u>
- (2) <u>Vertical zone, measured vertically from the floor to 2.5 m (8 ft) above the top of the bathtub rim or shower stall threshold</u>

The identified zone shall be all-encompassing and include the space directly over the bathtub or shower stall and the space below this zone, but not the space separated by a floor, wall, ceiling, room door, window, or fixed barrier.

Exception No. 1: Receptacles installed in accordance with 680.73 shall be permitted.

<u>Exception No. 2: In bathrooms with less than the required zone, the receptacle(s) required</u> by 210.52(D) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.

<u>Exception No. 3: Weight supporting ceiling receptacles (WSCRs) shall be permitted to be</u> installed for listed luminaires that employ weight supporting attachment fittings (WSAFs) in damp locations complying with <u>410.10(D)</u>.

<u>Exception No. 4: In dwelling units, single receptacles shall be permitted for electronic toilets</u> or personal hygiene devices such as electronic bidet seats. The receptacle shall be readily accessible and not located in the space between the toilet and the bathtub or shower.

Informational Note No. 1: See 210.8(A)(1) for GFCI requirements in a bathroom.

Informational Note No. 2: See 210.11(C) for bathroom branch circuits.

Informational Note No. 3: See 210.21(B)(1) for single receptacle on an individual branch.

<u>(2)</u>

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<u>Snap</u> Switches.

<u>Snap</u> <u>Switches shall not be installed within tub or shower spaces unless installed as part of a listed tub or shower assembly.</u>

(D) Flush Mounting with Faceplate.

The enclosure for a receptacle installed in an outlet box flush-mounted in a finished surface shall be made weatherproof by means of a weatherproof faceplate assembly that provides a watertight connection between the plate and the finished surface.

<u>406.</u>

10 Wiring Device

10 Snap Switch and Receptacle Terminations.

Wiring device

Snap switch and receptacle terminations shall comply with the following:

Wiring devices

(1) <u>Snap switches and receptacles marked CO/ALR shall be permitted to directly terminate aluminum, copper, or copper-clad aluminum conductors in accordance with the branch-circuit conductor size (AWG) identified by the manufacturer's instructions.</u>

(2) <u>For</u>

wiring devices

- (1) <u>snap switches and receptacles not marked CO/ALR, the following shall apply:</u>
 - (2) They shall not be permitted to directly terminate aluminum conductors.
 - (3) <u>They shall be permitted to terminate directly to conductors other than aluminum in accordance with the branch-circuit conductor size (AWG) and type identified in the manufacturer's instruction.</u>

Wiring devices

(1) <u>Snap switches and receptacles installed using screwless terminals of conductor push-in</u> <u>type construction (also known as *push-in-terminals*) shall be installed on not greater than <u>15-ampere branch circuits and be connected with 14 AWG solid copper wire only.</u></u>

Informational Note: See UL 498-2017, Attachment Plugs and Receptacles, for information regarding screwless terminals of various type constructions employed on receptacles. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 498 as screwless terminals of conductor push-in type construction (also known as push-in terminals).

Part II. Receptacles, Cord Connectors, and Attachment Plugs (Caps)

406.11 Receptacle Rating and Type.

(A) Receptacles.

<u>Receptacles shall be marked with the manufacturer's name or identification and voltage and ampere ratings.</u>

(B) Rating.

Receptacles and cord connectors shall be rated not less than 15 amperes, 125 volts, or 15 amperes, 250 volts, and be of a type not suitable for use as lampholders.

Informational Note: See 210.21(B) for receptacle ratings where installed on branch circuits.

(C) Isolated Ground Receptacles.

<u>Receptacles incorporating isolated equipment grounding conductor connections intended for</u> the reduction of electromagnetic interference as permitted in <u>250.146(D)</u> shall be identified by an orange triangle located on the face of the receptacles.

(1) Isolated Equipment Grounding Conductor Required.

<u>Isolated ground receptacles shall be used only with equipment grounding conductors that are</u> <u>isolated in accordance with 250.146(D)</u>.

(2) Installation in Nonmetallic Boxes.

<u>Isolated ground receptacles installed in nonmetallic boxes shall be covered with nonmetallic faceplates.</u>

<u>Exception:</u> Where an isolated ground receptacle is installed in a nonmetallic box, a metal faceplate shall be permitted if the box contains a feature or accessory that permits the connection of the faceplate to the equipment grounding conductor.

(D) Controlled Receptacle Marking.

<u>All nonlocking-type, 125-volt, 15- and 20-ampere receptacles that are controlled by an</u> <u>automatic control device, or that incorporate control features that remove power from the</u> <u>receptacles for the purpose of energy management or building automation, shall be</u> <u>permanently marked with the symbol shown in Figure 406.11(D) and the word "controlled."</u>

For receptacles controlled by an automatic control device, the marking shall be located on the receptacle face and visible after installation.

In both cases where a multiple receptacle device is used, the required marking of the word "controlled" and symbol shall denote which contact device(s) is controlled.

Figure 406.11(D) Controlled Receptacle Marking Symbol.



<u>Exception:</u> The marking shall not be required for receptacles controlled by a wall switch that provide the required room lighting outlets as permitted by 210.70.

(E) Receptacle with USB Charger.

<u>A 125-volt 15- or 20-ampere receptacle that additionally provides Class 2 power shall be listed</u> and constructed such that the Class 2 circuitry is integral with the receptacle.

406.12 General Installation Requirements.

<u>Receptacle outlets shall be located in branch circuits in accordance with Article 210, Part III.</u> <u>General installation shall comply with 406.12(A) through 406.12(G).</u>

(A) Grounding Type.

Except as provided in 406.12(D), receptacles installed on 15- and 20-ampere branch circuits shall be of the grounding type. Grounding-type receptacles shall be installed only on circuits of the voltage class and current for which they are rated, except as provided in 210.21(B)(1) for single receptacles or in Table 210.21(B)(2) and Table 210.21(B)(3) for two or more receptacles.

(B) Connection to Equipment Grounding Conductors.

<u>Receptacles and cord connectors that have equipment grounding conductor contacts shall</u> <u>have those contacts connected to equipment grounding conductors.</u>

<u>Exception No. 1: Receptacles mounted on portable and vehicle-mounted generator sets and generators in accordance with 250.34 shall not be required to be connected to an equipment grounding conductor.</u>

<u>Exception No. 2: Replacement receptacles as permitted by 406.12(D) shall not be required</u> to be connected to an equipment grounding conductor.

(C) Methods of Connection to Equipment Grounding Conductors.

<u>The equipment grounding conductor contacts of receptacles shall be connected to an equipment grounding conductor of the circuit supplying the receptacle in accordance with 250.146.</u>

<u>Cord connectors shall be connected to the equipment grounding conductor of the circuit supplying the cord connector.</u>

Informational Note No. 1: See 250.118 for acceptable grounding means.

Informational Note No. 2: See 250.130 for extensions of existing branch circuits.

(D) Replacements.

<u>Replacement of receptacles shall comply with 406.12(D)(1) through 406.12(D)(8)</u>, as applicable. Arc-fault circuit-interrupter type and ground-fault circuit-interrupter type receptacles shall be installed in readily accessible locations.

(1) Grounding-Type Receptacles.

<u>Where a grounding means exists in receptacle enclosures or an equipment grounding</u> <u>conductor is installed in accordance with 250.130(C), grounding-type receptacles shall be</u> <u>used and be connected to the equipment grounding conductor in accordance with 406.12(C)</u> <u>or 250.130(C)</u>.

(2) Non-Grounding-Type Receptacles.

<u>Where attachment to equipment grounding conductors does not exist in receptacle</u> <u>enclosures, the installation shall comply with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)</u> (2)(c).

- (1) <u>Non-grounding-type receptacles shall be permitted to be replaced with other non-grounding-type receptacles.</u>
- (2) <u>Non-grounding-type receptacles shall be permitted to be replaced with ground-fault circuit interrupter-type receptacles. These receptacles or their cover plates shall be marked "No Equipment Ground." Equipment grounding conductors shall not be connected from the ground-fault circuit-interrupter-type receptacles to any outlets supplied from the ground-fault circuit-interrupter receptacles.</u>
- (3) <u>Non-grounding-type receptacles shall be permitted to be replaced with grounding-type receptacles where supplied through ground-fault circuit interrupters. Where grounding-type receptacles are supplied through ground-fault circuit interrupters, grounding-type receptacles or their cover plates shall be marked "GFCI Protected" and "No Equipment Ground," visible after installation. Equipment grounding conductors shall not be connected between the grounding-type receptacles.</u>

Informational Note No. 1: Some equipment or appliance manufacturers require that the branch circuit to the equipment or appliance includes an equipment grounding conductor.

Informational Note No. 2: See 250.114 for a list of cord- and plug-connected equipment or appliances that require equipment grounding conductors.

(3) Ground-Fault Circuit-Interrupter Protection.

<u>Ground-fault circuit-interrupter protection for receptacles shall be provided where</u> <u>replacements are made at receptacle outlets that are required to be so protected elsewhere in</u> <u>this code.</u>

<u>Exception:</u> The receptacle shall be permitted to be replaced with a new receptacle of the existing type, where GFCI protection is provided and the receptacle is marked "GFCI Protected" and "No Equipment Ground," in accordance with 406.12(D)(2)(a), 406.12(D)(2) (b), or 406.12(D)(2)(c), as applicable, where all of the following conditions exist:

- (1) <u>The outlet box size will not permit the installation of the GFCI receptacle.</u>
- (2) <u>No electrically upstream outlet box will permit the installation of a GFCI receptacle.</u>
- (3) <u>A GFCI circuit breaker cannot provide the required GFCI protection.</u>

(4) Arc-Fault Circuit-Interrupter Protection.

If a receptacle supplied by a 120-volt, single-phase, 15- or 20-ampere branch circuit located in any areas specified in 210.12(B), 210.12(C), or 210.12(D) is replaced, a replacement receptacle at this outlet shall be one of the following:

- (1) <u>A listed outlet branch-circuit type AFCI receptacle</u>
- (2) <u>A receptacle protected by a listed outlet branch-circuit type AFCI type receptacle</u>
- (3) <u>A receptacle protected by a listed combination type AFCI circuit breaker</u>

Exception: Section 210.12(E) Exception shall not apply to replacement of receptacles.

(5) Tamper-Resistant Receptacles.

Listed tamper-resistant receptacles shall be provided where replacements are made at receptacle outlets that are required to be tamper-resistant elsewhere in this code, except in one of the following cases:

- (1) <u>Where nongrounding receptacles are replaced with other nongrounding receptacles</u>
- (2) <u>Where aluminum branch-circuit conductors are directly terminated on CO/ALR</u> receptacles, installed as replacements

(6) Weather-Resistant Receptacles.

Weather-resistant receptacles shall be provided where replacements are made at receptacle outlets that are required to be so protected elsewhere in this code.

(7) Controlled Receptacles.

Automatically controlled receptacles shall be replaced with equivalently controlled receptacles. If automatic control is no longer required, such receptacles and any associated receptacles marked in accordance with 406.11(D) shall be replaced with receptacles and faceplates not marked in accordance with 406.11(D).

(8) Ground-Fault Protection of Equipment (GFPE).

<u>Receptacles shall be provided with ground-fault protection of equipment (GFPE) where</u> <u>replacements are made at receptacle outlets that are required to be so protected elsewhere in</u> <u>this code.</u>

(E) Cord- and Plug-Connected Equipment.

The installation of grounding-type receptacles shall not be used as a requirement that all cordand plug-connected equipment be of the grounded type.

Informational Note: See 250.114 for types of cord- and plug-connected equipment to be grounded.

(F) Noninterchangeable Types.

<u>Receptacles connected to circuits that have different voltages, frequencies, or types of current</u> (ac or dc) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(G) Protection of Floor Receptacles.

Protection for floor receptacles shall comply with the following:

- (1) <u>Physical protection of floor receptacles shall allow floor-cleaning equipment to be</u> operated without damage to receptacles.
- (2) <u>All 125-volt, single-phase, 15- and 20-ampere floor receptacles installed in food courts</u> and waiting spaces of passenger transportation facilities shall be GFCI protected.

406.14 Receptacle Mounting.

Receptacles shall be mounted in identified boxes or assemblies. Boxes or assemblies shall be securely fastened in place unless otherwise permitted elsewhere in this code. Screws used for the purpose of attaching receptacles to boxes shall be of the type provided with listed receptacles, or be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions.

(A) Boxes That Are Set Back.

<u>Receptacles mounted in boxes that are set back from finished surfaces as permitted in</u> 314.20 shall be installed such that the mounting yokes or straps of the receptacles are held rigidly at the finished surfaces.

(B) Boxes That Are Flush.

<u>Receptacles mounted in boxes that are flush with finished surfaces or project therefrom shall</u> be installed such that the mounting yokes or straps of the receptacles are held rigidly against the boxes or box covers.

(C) Receptacles Mounted on Covers.

Receptacles mounted to and supported by covers shall be held rigidly against the covers by more than one screw or be device assemblies or box covers listed and identified for securing by a single screw.

(D) Position of Receptacle Faces.

After installation, receptacle faces shall be flush with or project from faceplates of insulating material and project a minimum of 0.4 mm (0.015 in.) from metal faceplates.

<u>Exception:</u> Listed kits or assemblies encompassing receptacles and nonmetallic faceplates that cover the receptacle faces, where the plates cannot be installed on any other receptacles, shall be permitted.

(E) Receptacles in Countertops.

<u>Receptacle assemblies for installation in countertop surfaces shall be listed for countertop</u> <u>applications. Where receptacle assemblies for countertop applications are required to provide</u> <u>ground-fault circuit-interrupter protection for personnel in accordance with 210.8, such</u> <u>assemblies shall be permitted to be listed as GFCI receptacle assemblies for countertop</u> <u>applications.</u>

(F) Receptacles in Work Surfaces.

<u>Receptacle assemblies and GFCI receptacle assemblies listed for work surface or countertop applications shall be permitted to be installed in work surfaces.</u>

(G) Receptacle Orientation.

Receptacles shall not be installed in a face-up position in any of the following locations:

- (1) <u>In or on countertop surfaces or work surfaces unless listed for countertop or work</u> <u>surface applications</u>
- (2) <u>In the area below a sink</u>
- (3) <u>In a laundry area, unless permitted by 406.14(G)(1)</u>

(H) Receptacles in Seating Areas and Other Similar Surfaces.

In seating areas or similar surfaces, receptacles shall not be installed in a face-up position unless the receptacles are any of the following:

- (1) Part of an assembly listed as a furniture power distribution unit
- (2) Part of an assembly listed either as household furnishings or as commercial furnishings
- (3) <u>Listed either as a receptacle assembly for countertop applications or as a GFCI</u> receptacle assembly for countertop applications
- (4) Installed in a listed floor box
- (I) Exposed Terminals.

Receptacles shall be enclosed so that live wiring terminals are not exposed to contact.

(J) Voltage Between Adjacent Devices.

<u>Receptacles shall not be grouped or ganged in enclosures with other receptacles, snap</u> <u>switches, or similar devices unless they are arranged so that the voltage between adjacent</u> <u>devices does not exceed 300 volts or unless they are installed in enclosures equipped with</u> identified, securely installed barriers between adjacent devices.

406.16 Receptacle Faceplates (Cover Plates).

<u>Receptacle faceplates shall be installed to completely cover openings and seat against</u> <u>mounting surfaces.</u>

<u>Receptacle faceplates mounted inside boxes having recess-mounted receptacles shall</u> <u>effectively close openings and seat against mounting surfaces.</u>

(A) Thickness of Metal Faceplates.

Metal faceplates shall be of ferrous metal not less than 0.76 mm (0.030 in.) in thickness or of nonferrous metal not less than 1.02 mm (0.040 in.) in thickness.

(B) Grounding.

Metal faceplates shall be grounded.

(C) Faceplates of Insulating Material.

Faceplates of insulating material shall comply with the following:

- (1) <u>They shall be noncombustible.</u>
- (2) <u>They shall not be less than 2.54 mm (0.10 in.) in thickness unless formed or reinforced</u> to provide adequate mechanical strength.
(D) <u>Receptacle Faceplates (Cover Plates) with Integral Night Lights, USB Chargers, or Both.</u>

Flush device faceplates (cover plates) that integrally incorporate night lights, Class 2 output connectors (USB chargers), or both shall comply with all of the following:

- (1) <u>Faceplate (cover plate) assemblies shall be listed.</u>
- (2) <u>During normal operation, night light and Class 2 supply connections shall not introduce</u> <u>current to the grounding means or to the equipment grounding conductor.</u>
- (3) <u>Night lights and Class 2 connections (USB chargers), if relying on spring-tensioned</u> <u>contacts for electrical power, shall comply with the following:</u>
 - (4) <u>They shall not be rated more than 1 watt.</u>
 - (5) <u>They shall be connected to only unpainted or unenameled heads of receptacle terminal screws made only of copper alloy unless the faceplate (cover plate) is additionally listed and identified that the spring-tensioned contacts are suitable for connection to unpainted or unenameled heads of terminal screws made of plated steel.</u>

406.18 Attachment Plugs, Cord Connectors, and Flanged Surface Devices.

<u>All attachment plugs, cord connectors, and flanged surface devices (inlets and outlets) shall</u> <u>be marked with the manufacturer's name or identification and voltage and ampere ratings.</u>

(A) Construction of Attachment Plugs and Cord Connectors.

<u>Attachment plugs and cord connectors shall be constructed so that there are no exposed</u> <u>current-carrying parts except the prongs, blades, or pins. The cover for wire terminations shall</u> <u>be a part that is essential for the operation of attachment plugs or connectors (dead-front</u> <u>construction).</u>

(B) Connection of Attachment Plugs.

<u>Attachment plugs shall be installed so that their prongs, blades, or pins are not energized</u> <u>unless inserted into energized receptacles or cord connectors. No receptacle shall be installed</u> <u>so as to require the insertion of an energized attachment plug as its source of supply.</u>

(C) Attachment Plug Ejector Mechanisms.

Attachment plug ejector mechanisms shall not adversely affect engagement of the blades of attachment plugs with the contacts of receptacles.

(D) Flanged Surface Inlet.

Flanged surface inlets shall be installed such that the prongs, blades, or pins are not energized unless energized cord connectors are inserted into them.

406.19 Grounding-Type Receptacles, Adapters, Cord Connectors, and Attachment Plugs.

(A) Grounding Poles (Connections).

<u>Grounding-type receptacles, cord connectors, and attachment plugs shall be provided with</u> <u>one fixed grounding pole in addition to the circuit poles. The grounding contacting pole of</u> <u>grounding-type plug-in ground-fault circuit interrupters shall be permitted to be of the movable,</u> <u>self-restoring type on circuits operating at not over 150 volts between any two conductors or</u> <u>any conductor and ground.</u> (B) Grounding-Pole (Connection) Identification.

<u>Grounding-type receptacles, adapters, cord connections, and attachment plugs shall have a</u> means for connection of an equipment grounding conductor to the grounding pole.

A terminal for connection to the grounding pole shall be designated by one of the following:

- (1) <u>A green-colored hexagonal-headed or -shaped terminal screw or nut, not readily</u> <u>removable</u>
- (2) A green-colored pressure wire connector body (a wire barrel)
- (3) <u>A similar green-colored connection device, in the case of adapters, as follows:</u>
 - (4) <u>The grounding terminal of a grounding adapter shall be a green-colored rigid ear,</u> <u>lug, or similar device.</u>
 - (5) <u>The equipment grounding connection shall be designed such that it cannot make</u> <u>contact with current-carrying parts of the receptacle, adapter, or attachment plug.</u>
 - (6) <u>The adapter shall be polarized.</u>
- (7) If the terminal for the equipment grounding conductor is not visible, as follows:
 - (8) <u>The conductor entrance hole shall be marked with the word green or ground, the letters *G* or *GR*, a grounding symbol, or otherwise identified by a distinctive green color.</u>
 - (9) <u>If the terminal for the equipment grounding conductor is readily removable, the area</u> <u>adjacent to the terminal shall be similarly marked.</u>

Informational Note: See Figure Informational Note 406.19(B).

Figure Informational Note 406.19(B) Example of Symbol Used to Identify Termination Point for an Equipment Grounding Conductor.



(C) Grounding Terminal Use.

<u>Grounding terminals shall not be used for purposes other than connection to equipment</u> <u>grounding conductors.</u> (D) Grounding-Pole (Connection) Requirements.

<u>Grounding-type attachment plugs and mating cord connectors and receptacles shall be</u> <u>designed such that the equipment grounding connection is made before current-carrying</u> <u>connections. Grounding-type devices shall be designed such that grounding poles of</u> <u>attachment plugs cannot be brought into contact with current-carrying parts of receptacles or</u> <u>cord connectors.</u>

(E)_Use.

<u>Grounding-type attachment plugs shall be used only with cords having equipment grounding conductors.</u>

Informational Note: See 250.126 for identification of equipment grounding conductor terminals.

406.20 Noninterchangeability.

Receptacles, cord connectors, and attachment plugs shall be constructed such that receptacle or cord connectors do not accept attachment plugs with different voltages or current ratings from that for which the devices are intended. However, 20-ampere T-slot receptacles or cord connectors shall be permitted to accept 15-ampere attachment plugs of the same voltage rating. Non-grounding-type receptacles and connectors shall not accept grounding-type attachment plugs.

406.24 Connecting Receptacle Grounding Terminal to Box.

Connection of receptacle grounding terminals shall comply with 250.146.

406.26 Tamper-Resistant Receptacles.

All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the following locations shall be listed tamper-resistant receptacles:

- (1) <u>All dwelling units, boathouses, mobile homes and manufactured homes, including their</u> <u>attached and detached garages, accessory buildings, and common areas</u>
- (2) <u>Guest rooms and guest suites of hotels, motels, and their common areas</u>
- (3) <u>Child care facilities</u>
- (4) _ Preschools and education facilities
- (5) <u>Within clinics, medical and dental offices, and outpatient facilities, the following spaces:</u>
 - (6) <u>Business offices accessible to the general public</u>
 - (7) _ Lobbies and waiting spaces
 - (8) Spaces of nursing homes and limited care facilities covered in 517.10(B)(2).
- (9) <u>Places of awaiting transportation, gymnasiums, skating rinks, fitness centers, and auditoriums</u>
- (10) <u>Dormitories</u>
- (11) <u>Residential care/assisted living facilities, social and substance abuse rehabilitation</u> <u>facilities, and group homes</u>
- (12) <u>Foster care facilities, nursing homes, and psychiatric hospitals</u>
- (13) Areas of agricultural buildings accessible to the general public and any common areas
- (14) <u>Park and recreation areas</u>

Informational Note No. 1: See ANSI/NEMA WD 6-2016, Wiring Devices — Dimensional Specifications. This requirement would include receptacles identified as 5-15, 5-20, 6-15, and 6-20.

Informational Note No. 2: See NFPA 5000-2024, *Building Construction and Safety* <u>Code</u>, and the <u>International Building Code</u> (IBC)-2021 for more information on <u>occupancy classifications for the types of facilities covered by this requirement.</u>

Informational Note No. 3: Areas of agricultural building are frequently converted to hospitality areas. These areas can include petting zoos, stables, and buildings used for recreation or educational purposes where receptacles are installed.

Informational Note No. 4: Park and recreation areas can include garden areas, play areas, and similar areas.

<u>Exception to (1) through (10):</u> <u>Receptacles in the following locations shall not be</u> required to be tamper resistant:

- (15) <u>Receptacles located more than 1.7 m (5</u> $\frac{1}{2}$ <u>ft</u>) above the floor
- (16) <u>Receptacles that are part of a luminaire or appliance</u>
- (17) Where the receptacle outlet is installed within the space occupied by or designated for each appliance that, in normal use, is not easily moved from one place to another and is cord-and-plug-connected in accordance with 400.10(A)(6), 400.10(A)(7), or 400.10(A)(8), the following are permitted:

(18) <u>A single receptacle that is not readily accessible and supplies one appliance</u>

(19) A duplex receptacle that is not readily accessible and supplies two appliances

(20) Nongrounding receptacles used for replacements as permitted in 406.12(D)(2)(a)

406.28 Single-Pole Separable-Connector Type.

<u>Single-pole separable connectors shall be listed and labeled and comply with 406.28(A)</u> <u>through 406.28(D)</u>.

(A) Locking or Latching Type.

<u>Single-pole separable connectors shall be of either the locking or latching type and marked</u> with the manufacturer's name or identification and voltage and ampere ratings.

(B) Identification.

Connectors designated for connection to grounded circuit conductors shall be identified by white-colored housing; connectors designated for connection to grounding circuit conductors shall be identified by green-colored housing.

(C) Interchangeability.

Single-pole separable connectors shall be permitted to be interchangeable for ac or dc use or for different current ratings or voltages on the same premises if they are listed for ac/dc use and marked in a suitable manner to identify the system to which they are intended to be connected.

(D) Connecting and Disconnecting.

The use of single-pole separable connectors shall be performed by qualified persons and comply with at least one of the following conditions:

- (1) <u>Connection and disconnection of connectors is only possible where the supply connectors</u> are interlocked to the source, and it is not possible to connect or disconnect connectors when the supply is energized.
- (2) <u>Line connectors are of the listed sequential-interlocking type so that load connectors are connected in the following sequence and that disconnection is in the reverse sequence:</u>
 - (3) Equipment grounding conductor connection
 - (4) Grounded circuit conductor connection, if provided
 - (5) <u>Ungrounded conductor connection</u>
- (6) <u>A caution notice that complies with 110.21(B) is provided on the equipment employing single-pole separable connectors, adjacent to the line connectors, indicating that connections are to be performed in the following sequence and that disconnection is in the reverse sequence:</u>
 - (7) Equipment grounding conductor connectors
 - (8) Grounded circuit-conductor connectors, if provided
 - (9) <u>Ungrounded conductor connectors</u>

Informational Note: See ANSI-UL 1691-2014, Single Pole Locking-Type Separable Connectors, for more information on single-pole locking-type separable connectors.

Part III. General-Use Snap Switches, Dimmers, and Electronic Control Switches

406.30 Switch Connections.

(A) Three-Way and Four-Way Switches.

<u>Three-way and four-way switches shall be wired so that all switching is done only in</u> <u>ungrounded circuit conductors. Where in metal raceways or metal-armored cables, wiring</u> <u>between switches and outlets shall comply with 300.22(A).</u>

Exception: Switch loops shall not require a grounded conductor.

(B) Grounded Conductors.

Switches or circuit breakers shall not disconnect the grounded conductors of circuits.

<u>Exception:</u> <u>A switch or circuit breaker shall be permitted to disconnect a grounded circuit</u> <u>conductor where all circuit conductors are disconnected simultaneously, or where the device</u> <u>is arranged so that the grounded conductor cannot be disconnected until all the ungrounded</u> <u>conductors of the circuit have been disconnected</u>.

(C) Switches Controlling Lighting Loads.

The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded generalpurpose branch circuit serving bathrooms, hallways, stairways, and habitable rooms or occupiable spaces as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations:

- (1) <u>Where conductors enter the box enclosing the switch through a raceway if the raceway is</u> <u>large enough for all contained conductors, including a grounded conductor</u>
- (2) Where snap switches with integral enclosures comply with 300.17(E)
- (3) <u>Where lighting in the area is controlled by automatic means</u>
- (4) Where a switch controls a receptacle load

The grounded conductor shall be extended to any switch location as necessary, be connected to switching devices that require line-to-neutral voltage to operate the electronics of the switch in the standby mode, and meet the requirements of 406.50.

<u>Exception:</u> The connection requirement shall not apply to replacement or retrofit switches installed in locations prior to local adoption of 406.30(C) and where the grounded conductor cannot be extended without removing finish materials. The number of electronic control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25. For the purpose of this exception, a neutral busbar, in compliance with 200.4(B) and to which a main or system bonding jumper is connected, shall not be limited as to the number of electronic lighting control switches connected.

Informational Note: The provision for a grounded conductor is to complete a circuit path for electronic lighting control devices.

406.32 Switch Enclosures.

Switches shall be of the externally operable type installed in device boxes or on covers listed for the intended use.

<u>Exception:</u> <u>Pendant- and surface-type snap switches mounted on open-face switchboards</u> <u>or panelboards shall be permitted without enclosures.</u>

406.34 Time Switches, Flashers, and Similar Devices.

<u>Time switches, flashers, and similar devices shall be of the enclosed type or be installed in device boxes.</u>

406.36 Indicating.

<u>General-use and motor circuit switches where mounted in enclosures as described in 406.32</u> shall indicate, in locations that are visible when accessing the external operation means, whether they are in the open (off) or closed (on) position.

<u>Exception:</u> Vertically operated double-throw switches shall be permitted to be in the closed (on) position with the handle in either the up or down position.

406.38 Accessibility and Grouping.

(A) Location.

All switches and circuit breakers used as switches shall comply with the following:

- (1) <u>They shall be located so that they can be operated from readily accessible places.</u>
- (2) <u>They shall be installed such that the center of the grip of the operating handle of the switch or circuit breaker, when in its highest position, is not more than 2.0 m (6 ft 7 in.)</u> above the floor or working platform, except as follows:
 - (3) <u>On busway installations, fused switches and circuit breakers shall be permitted to be</u> located at the same level as the busway if suitable means is provided to operate the handle of the device from the floor.
 - (4) <u>Switches and circuit breakers installed adjacent to motors, appliances, or other equipment that they supply shall be permitted to be located higher than 2.0 m (6 ft 7 in.) and to be accessible by portable means.</u>
 - (5) <u>Hookstick operable isolating switches shall be permitted at greater heights.</u>
- (B) Voltage Between Adjacent Devices.

<u>Snap switches shall not be grouped or ganged in enclosures with other snap switches,</u> <u>receptacles, or similar devices unless they are arranged so that the voltage between adjacent</u> <u>devices does not exceed 300 volts, or unless they are installed in enclosures equipped with</u> <u>identified, securely installed barriers between adjacent devices.</u>

(C) Multipole Snap Switches.

<u>Multipole, general-use snap switches shall not be fed from more than a single circuit unless</u> they are listed and marked as two-circuit or three-circuit switches.

Informational Note: See 210.7 for disconnect requirements where more than one circuit supplies a switch.

406.40 General-Use Snap Switches, Dimmers, and Control Switches.

(A) Faceplate (Cover Plate) Mounting.

<u>Faceplates provided for snap switches, dimmers, and control switches mounted in boxes and other enclosures shall be installed to completely cover the opening and, where the switch is flush mounted, seat against the finished surface.</u>

<u>Faceplates that are installed on receptacles mounted on the same box as snap switches, dimmers, and control switches shall comply with 406.14(C), 406.14(D), 406.16, and, as applicable, 406.9.</u>

(B) Grounding.

<u>Snap switches, dimmers, and control switches shall be connected to an equipment grounding conductor and provide a means to connect metal faceplates to the equipment grounding conductor, whether or not metal faceplates are installed. Metal faceplates shall be bonded to the equipment grounding conductor. Snap switches, dimmers, control switches, and metal faceplates shall be connected to equipment grounding conductors using either of the following methods:</u>

- (1) <u>The switch is mounted with metal screws to a metal box or metal cover that is connected</u> to an equipment grounding conductor or to a nonmetallic box with integral means for connecting to an equipment grounding conductor.
- (2) <u>An equipment grounding conductor or equipment bonding jumper is connected to an equipment grounding termination of the snap switch.</u>

Exception No. 1: Where no means exists within the enclosure for bonding to the equipment grounding conductor, or where the wiring method does not include or provide an equipment grounding conductor, a snap switch without a connection to an equipment grounding conductor shall be permitted for replacement purposes only. A snap switch wired under the provisions of this exception and located within 2.5 m (8 ft) vertically, or 1.5 m (5 ft) horizontally, of ground or exposed grounded metal objects shall be provided with a faceplate of nonconducting noncombustible material with nonmetallic attachment screws, unless the switch mounting strap or yoke is nonmetallic or the circuit is protected by a ground-fault circuit interrupter.

Exception No. 2: Listed kits or listed assemblies shall not be required to be bonded to an equipment grounding conductor if all of the following conditions are met:

- (1) <u>The device is provided with a nonmetallic faceplate, and the device is designed such</u> <u>that no metallic faceplate replaces the one provided.</u>
- (2) <u>The device does not have mounting means to accept other configurations of faceplates.</u>
- (3) The device is equipped with a nonmetallic yoke.
- (4) <u>All parts of the device that are accessible after installation of the faceplate are</u> manufactured of nonmetallic materials.

<u>Exception No. 3: A snap switch with an integral nonmetallic enclosure complying with</u> <u>300.17(E) shall be permitted without a bonding connection to an equipment grounding</u> <u>conductor.</u>

(C) Faceplate (Cover Plate) Construction.

<u>Metal faceplates shall be constructed of ferrous metal not less than 0.76 mm (0.030 in.) in</u> <u>thickness or of nonferrous metal not less than 1.02 mm (0.040 in.) in thickness. Faceplates of</u> <u>insulating material shall be noncombustible and be not less than 2.54 mm (0.100 in.) in</u> <u>thickness unless formed or reinforced to provide adequate mechanical strength.</u> (D) Faceplates (Cover Plates) Incorporating Night Lights, USB Chargers, or Both.

For snap switches, dimmers, and control switches, faceplates (cover plates) that integrally incorporate night lights Class 2 connections (USB chargers), or both shall comply with all the following:

- (1) <u>Faceplate (cover plate) assemblies shall be listed.</u>
- (2) <u>During normal operation, night lights and Class 2 connections (USB chargers) shall not</u> introduce current to the bonding means or the equipment grounding conductors.
- (3) <u>Electrical power supply connections to night lights and Class 2 connections (USB chargers) shall not be connected across the line and load terminals of snap switches, dimmers, and control switches having a marked OFF position.</u>
- (4) <u>Night lights and Class 2 connections (USB chargers), if relying on spring-tensioned</u> <u>contacts for electrical power, shall comply with the following:</u>
 - (5) They shall not be rated more than 1 watt.
 - (6) <u>They shall be connected to only unpainted or unenameled heads of switch terminal screws made of only copper alloy unless the faceplate (cover plate) is additionally listed and identified that the spring-tensioned contacts are suitable for connection to unpainted or unenameled heads of terminal screws made of steel.</u>

406.42 Mounting of General-Use Snap Switches, Dimmers, and Control Switches.

(A) Surface Type.

General-use snap switches, dimmers, and control switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least

<u>13 mm ($\frac{1}{2}$ in.) from the surface wired over.</u>

(B) Box Mounted.

<u>Flush-type general-use snap switches, dimmers, and control switches mounted in boxes that</u> <u>are set back of the finished surface as permitted in 314.20 shall be installed so that the</u> <u>extension plaster ears are seated against the surface. Flush-type devices mounted in boxes</u> <u>that are flush with the finished surface or project from it shall be installed so that the mounting</u> <u>yoke or strap of the device is seated against the box. Screws used for the purpose of attaching</u> <u>a device to a box shall either be of the type provided with a listed device, or be machine</u> <u>screws having 32 threads per inch or part of listed assemblies or systems, in accordance with</u> <u>the manufacturer's instructions.</u>

406.44 Grounding of Enclosures.

Metal enclosures for switches shall be connected to equipment grounding conductors as specified in Article 250, Part IV. Metal enclosures for switches used as service equipment shall comply with the requirements of Article 250, Part V. Where nonmetallic enclosures are used with metal raceways or metal-armored cables, they shall comply with 314.3 Exception No. 1 or No. 2.

Except as covered in <u>406.40(B)</u> Exception No. 1, nonmetallic boxes for switches shall be installed with a wiring method that provides or includes an equipment grounding conductor.

406.46 Rating and Use of Switches.

Switches shall be marked with their ratings.

Informational Note No. 1: See 600.6 for switches for signs and outline lighting.

Informational Note No. 2: See 430.83, 430.109, and 430.110 for switches controlling motors.

(A) <u>Alternating-Current General-Use Snap Switches.</u>

<u>Alternating-current general-use snap switches shall only be used on ac circuits and used for controlling the following:</u>

- (1) <u>Resistive and inductive loads not exceeding the ampere rating of the switch at the voltage applied</u>
- (2) <u>Tungsten-filament lamp loads not exceeding the ampere rating of the switch at 120 volts</u>
- (3) <u>Electric discharge lamp loads not exceeding the marked ampere and voltage rating of the</u> <u>switch</u>
- (4) <u>Motor loads not exceeding 80 percent of the ampere rating of the switch at its rated</u> voltage
- (5) <u>Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads</u> with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied
- (B) Alternating-Current or Direct-Current General-Use Snap Switches.

<u>Alternating-current or direct-current general-use snap switches shall be permitted on either ac</u> or dc circuits and used only for controlling the following:

- (1) <u>Resistive loads not exceeding the ampere rating of the switch at the voltage applied.</u>
- (2) Inductive loads not exceeding 50 percent of the ampere rating of the switch at the applied voltage. Switches rated in horsepower are suitable for controlling motor loads within their rating at the voltage applied.
- (3) <u>Tungsten-filament lamp loads not exceeding the ampere rating of the switch at the applied</u> <u>voltage if T-rated.</u>
- (4) <u>Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads</u> with their associated drivers, not exceeding the ampere rating of the switch at the voltage <u>applied.</u>
- (C) Snap Switch Terminations.

Snap switch terminations shall comply with the following:

- (1) <u>Copper, aluminum, and copper-clad aluminum conductors shall be permitted to terminate at the terminals of snap switches marked CO/ALR.</u>
- (2) <u>Only copper and copper-clad aluminum conductors shall be permitted to be terminated at the terminals of 15-ampere and 20-ampere snap switches not marked CO/ALR.</u>
- (3) <u>Snap switches connected using screwless terminals of conductor push-in type</u> <u>construction (also known as conductor push-in terminals) shall be installed on not greater</u> <u>than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only</u> <u>unless listed and marked for other types of conductors.</u>

Informational Note: See UL 20-2018, General-Use Snap Switches, for information regarding screwless terminals of various voltage type constructions employed on snap switches. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 20 as screwless terminals of conductor push-in type construction (also known as conductor push-in terminals). (D) Alternating-Current General-Use Snap Switches Rated for 347 Volts.

<u>Alternating-current general-use snap switches shall not be rated less than 15 amperes at a voltage of 347 volts ac, and they shall not be readily interchangeable in box mounting with switches covered in 406.46(A) and 406.46(B). These switches shall be used only for controlling any of the following:</u>

- (1) <u>Noninductive loads other than tungsten-filament lamps not exceeding the ampere and voltage ratings of the switch.</u>
- (2) <u>Inductive loads not exceeding the ampere and voltage ratings of the switch. Where</u> <u>particular load characteristics or limitations are specified as a condition of the listing, those</u> <u>restrictions shall be observed, regardless of the ampere rating of the load.</u>
- (3) <u>Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads</u> with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied.

(E) Dimmer and Electronic Control Switches.

General-use dimmer switches and electronic control switches, such as timing switches and occupancy sensors, shall be used only to control permanently connected loads, such as incandescent luminaires, unless listed for the control of other loads and installed accordingly. They shall be marked by their manufacturer with their current and voltage ratings and used for loads that do not exceed their ampere rating at the voltage applied.

(F) Cord- and-Plug-Connected Loads.

Where snap switches or control devices are used to control cord-and-plug-connected equipment on general-purpose branch circuits, each snap switch or control device controlling receptacle outlets or cord connectors that are supplied by permanently connected cord pendants shall be rated at not less than the rating of the maximum permitted ampere rating or setting of the overcurrent device protecting the receptacles or cord connectors, as provided in 210.21(B).

Informational Note: See 210.50(A) and 400.10(A)(1) for equivalency to a receptacle outlet of a cord connector that is supplied by a permanently connected cord pendant.

<u>Exception:</u> Where a snap switch or control device is used to control not more than one receptacle on a branch circuit, the switch or control device shall be permitted to be rated at not less than the rating of the receptacle.

406.48 Marking.

(A) Ratings.

Switches shall be marked with the current, voltage, and, if horsepower rated, the maximum rating for which they are designed.

(B) Off Indication.

Where in the off position, a switching device with a marked OFF position shall completely disconnect all ungrounded conductors to the load it controls.

406.50 Electronic Control Switches.

Electronic control switches shall not introduce current on the equipment grounding conductors during normal operation.

<u>Exception:</u> Electronic control switches that introduce current on equipment grounding conductors shall be permitted for applications covered by 406.30(C) Exception. Electronic control switches that introduce current on equipment grounding conductors shall be listed and marked for use in replacement or retrofit applications only.

Statement of Problem and Substantiation for Public Comment

This comment eliminates the generic term "wiring devices" and replaces it with the terms intended to be covered, namely snap switches and receptacles. The wiring device terminology, clearly applies to

devices that are wired, without limit. The word "device" as long defined in Art. 100, covers a unit of an electrical system that carries or controls electric energy as its principal function. This includes both snap switches and heavier switches that are still covered in Art. 404. The literal text is confusing and conflicts with Art. 404. The Correlating Committee should have flagged this.

Related Item

• PI 1544

Submitter Information Verification

Submitter Full Nan	1e: Frederic Hartwell
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Submittal Date:	Wed Aug 28 17:11:48 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Rejected Action:

Resolution: The title "Wiring Devices" and subsequent revisions referring to "wiring devices" was identified and selected as an inclusive means to identify all other types of products covered under the revised scope of Article 406. The suggested change merely identifies snap switches and receptacles, and over looks other devices such as attachment plugs, cord connectors, flanged surface devices, including both inlets and outlets, single-pole connectors, dimmers and electronic control switches. This change also supports the development of the new NEC format by capturing legacy devices under one article. Public Comment 504 and Correlating Committee Note 157 The Title of Article 406 was reviewed for correlation with the definition of "Wiring Devices" and the revisions in SR2 is consistent with the title.

Public Comment No. 407-NFPA 70-2024 [Article 406]

Article 406 Wiring Devices

Part I. General

406.1 Scope.

This article covers the rating, type, and installation of wiring devices.

406.2 Listing Requirements.

Wiring devices shall be listed.

406.3 Reconditioned Equipment.

Reconditioned wiring devices shall not be permitted to be installed.

406.9 Wiring Devices in Damp or Wet Locations.

(A) Damp Locations.

(1) Receptacles.

(a) *General*.Installations suitable for wet locations shall also be considered suitable for damp locations. Receptacles shall be considered to be in locations protected from the weather where located under roofed open porches, canopies, marquees, and similar and will not be subjected to beating rain or water runoff.

(b) *Weatherproof Enclosures*. Receptacles installed outdoors in locations protected from the weather or in other damp locations shall have enclosures and covers for the receptacles that are weatherproof when the receptacles are covered (attachment plug caps not inserted and receptacle covers closed).

(c) *Weather-Resistant Receptacle Type.* All 125- and 250-volt nonlocking receptacles shall be listed weather-resistant type.

(d) *Covers*. Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the covers are not designed to open 90 degrees from the closed to open position, after installation.

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, for the types of receptacles covered by this requirement.

(2) Switches.

Switches installed in damp locations shall comply with the following:

- (1) Surface-mounted switches shall be enclosed in weatherproof enclosures that comply with 312.2.
- (2) Flush-mounted switches shall be equipped with weatherproof covers.
- (B) Wet Locations.
- (1) Receptacles of 15 Amperes and 20 Amperes in a Wet Location.
- (a) Weatherproof Enclosure.

Receptacles of 15 amperes and 20 amperes, 125 volts and 250 volts installed in a wet location shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted.

(b) Outlet Box Hood.

An outlet box hood shall be identified as extra-duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood need not be identified as extra duty.

(c) Covers.

Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the cover is not designed to open 90 degrees from the closed to open position, after installation.

Informational Note: See ANSI/UL 514D–2016, *Cover Plates for Flush-Mounted Wiring Devices*, for extra-duty outlet box hoods. Extra duty identification and requirements are not applicable to listed receptacles, faceplates, outlet boxes, enclosures, or assemblies that are identified as either being suitable for wet locations or rated as one of the outdoor enclosure–type numbers of Table 110.28 that does not utilize an outlet box hood.

Exception: 15- and 20-ampere, 125- through 250-volt receptacles installed in a wet location and subject to routine high-pressure spray washing shall be permitted to have an enclosure that is weatherproof when the attachment plug is removed.

(d) Weather-Resistant Receptacle Type

All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles shall be listed and so identified as the weather-resistant type.

Informational Note: See ANSI/NEMA WD 6–2016, *Wiring Devices — Dimensional Specifications*, for receptacle configurations. The configuration of weather-resistant receptacles covered by this requirement are identified as 5-15, 5-20, 6-15, and 6-20.

(2) Other Receptacles.

All other receptacles installed in wet locations shall be listed weather-resistant type and be installed in accordance with 406.9(B)(2)(a) or 406.9(B)(2)(b).

(a) For supplying a product that is unattended while in use, the receptacle shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed.

(b) For supplying a product that is attended while in use (e.g., portable tools), the receptacle shall have an enclosure that is weatherproof when the attachment plug is removed.

(3) Switches.

Switches installed in wet locations shall comply with the following:

- (1) Surface-mounted switches shall be enclosed in weatherproof enclosures that comply with 312.2.
- (2) Flush-mounted switches shall be equipped with weatherproof covers.
- (C) Wiring Devices in Bathtub and Shower Spaces.

(1) Receptacles.

Receptacles shall not be installed inside of tubs or showers or within the following zones:

- (1) Horizontal zone, measured 900 mm (3 ft) horizontally from any outside edge of the bathtub or shower stall, including the space outside the bathtub or shower stall space below the zone
- (2) Vertical zone, measured vertically from the floor to 2.5 m (8 ft) above the top of the bathtub rim or shower stall threshold

The identified zone shall be all-encompassing and include the space directly over the bathtub or shower stall and the space below this zone, but not the space separated by a floor, wall, ceiling, room door, window, or fixed barrier.

Exception No. 1: Receptacles installed in accordance with 680.73 shall be permitted.

Exception No. 2: In bathrooms with less than the required zone, the receptacle(s) required by 210.52(D) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.

Exception No. 3: Weight supporting ceiling receptacles (WSCRs) shall be permitted to be installed for listed luminaires that employ weight supporting attachment fittings (WSAFs) in damp locations complying with 410.10(D).

Exception No. 4: In dwelling units, single receptacles shall be permitted for electronic toilets or personal hygiene devices such as electronic bidet seats. The receptacle shall be readily accessible and not located in the space between the toilet and the bathtub or shower.

Informational Note No. 1: See 210.8(A)(1) for GFCI requirements in a bathroom.

Informational Note No. 2: See 210.11(C) for bathroom branch circuits.

Informational Note No. 3: See 210.21(B)(1) for single receptacle on an individual branch.

(2) Switches.

Switches shall not be installed within tub or shower spaces unless installed as part of a listed tub or shower assembly.

(D) Flush Mounting with Faceplate.

The enclosure for a receptacle installed in an outlet box flush-mounted in a finished surface shall be made weatherproof by means of a weatherproof faceplate assembly that provides a watertight connection between the plate and the finished surface.

406.10 Wiring Device Terminations.

Wiring device terminations shall comply with the following:

- (1) Wiring devices marked CO/ALR shall be permitted to directly terminate aluminum, copper, or copper-clad aluminum conductors in accordance with the branch-circuit conductor size (AWG) identified by the manufacturer's instructions.
- (2) For wiring devices not marked CO/ALR, the following shall apply:
 - a. They shall not be permitted to directly terminate aluminum conductors.
 - b. They shall be permitted to terminate directly to conductors other than aluminum in accordance with the branch-circuit conductor size (AWG) and type identified in the manufacturer's instruction.
- (3) Wiring devices installed using screwless terminals of conductor push-in type construction (also known as *push-in-terminals*) shall be installed on not greater than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only.

Informational Note: See UL 498-2017, *Attachment Plugs and Receptacles*, for information regarding screwless terminals of various type constructions employed on receptacles. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 498 as screwless terminals of conductor push-in type construction (also known as push-in terminals).

Part II. Receptacles, Cord Connectors, and Attachment Plugs (Caps)

406.11 Receptacle Rating and Type.

(A) Receptacles.

Receptacles shall be marked with the manufacturer's name or identification and voltage and ampere ratings.

(B) Rating.

Receptacles and cord connectors shall be rated not less than 15 amperes, 125 volts, or 15 amperes, 250 volts, and be of a type not suitable for use as lampholders.

Informational Note: See 210.21(B) for receptacle ratings where installed on branch circuits.

(C) Isolated Ground Receptacles.

Receptacles incorporating isolated equipment grounding conductor connections intended for the reduction of electromagnetic interference as permitted in 250.146(D) shall be identified by an orange triangle located on the face of the receptacles.

(1) Isolated Equipment Grounding Conductor Required.

Isolated ground receptacles shall be used only with equipment grounding conductors that are isolated in accordance with 250.146(D).

(2) Installation in Nonmetallic Boxes.

Isolated ground receptacles installed in nonmetallic boxes shall be covered with nonmetallic faceplates.

Exception: Where an isolated ground receptacle is installed in a nonmetallic box, a metal faceplate shall be permitted if the box contains a feature or accessory that permits the connection of the faceplate to the equipment grounding conductor.

(D) Controlled Receptacle Marking.

All nonlocking-type, 125-volt, 15- and 20-ampere receptacles that are controlled by an automatic control device, or that incorporate control features that remove power from the receptacles for the purpose of energy management or building automation, shall be permanently marked with the symbol shown in Figure 406.11(D) and the word "controlled."

For receptacles controlled by an automatic control device, the marking shall be located on the receptacle face and visible after installation.

In both cases where a multiple receptacle device is used, the required marking of the word "controlled" and symbol shall denote which contact device(s) is controlled.

Figure 406.11(D) Controlled Receptacle Marking Symbol.



Exception: The marking shall not be required for receptacles controlled by a wall switch that provide the required room lighting outlets as permitted by 210.70.

(E) Receptacle with USB Charger.

A 125-volt 15- or 20-ampere receptacle that additionally provides Class 2 power shall be listed and constructed such that the Class 2 circuitry is integral with the receptacle.

406.12 General Installation Requirements.

Receptacle outlets shall be located in branch circuits in accordance with Article 210, Part III. General installation shall comply with 406.12(A) through 406.12(G).

(A) Grounding Type.

Except as provided in 406.12(D), receptacles installed on 15- and 20-ampere branch circuits shall be of the grounding type. Grounding-type receptacles shall be installed only on circuits of the voltage class and current for which they are rated, except as provided in 210.21(B)(1) for single receptacles or in Table 210.21(B)(2) and Table 210.21(B)(3) for two or more receptacles.

(B) Connection to Equipment Grounding Conductors.

Receptacles and cord connectors that have equipment grounding conductor contacts shall have those contacts connected to equipment grounding conductors.

Exception No. 1: Receptacles mounted on portable and vehicle-mounted generator sets and generators in accordance with 250.34 shall not be required to be connected to an equipment grounding conductor.

Exception No. 2: Replacement receptacles as permitted by 406.12(D) shall not be required to be connected to an equipment grounding conductor.

(C) Methods of Connection to Equipment Grounding Conductors.

The equipment grounding conductor contacts of receptacles shall be connected to an equipment grounding conductor of the circuit supplying the receptacle in accordance with 250.146.

Cord connectors shall be connected to the equipment grounding conductor of the circuit supplying the cord connector.

Informational Note No. 1: See 250.118 for acceptable grounding means.

Informational Note No. 2: See 250.130 for extensions of existing branch circuits.

(D) Replacements.

Replacement of receptacles shall comply with 406.12(D)(1) through 406.12(D)(8), as applicable. Arc-fault circuit-interrupter type and ground-fault circuit-interrupter type receptacles shall be installed in readily accessible locations.

(1) Grounding-Type Receptacles.

Where a grounding means exists in receptacle enclosures or an equipment grounding conductor is installed in accordance with 250.130(C), grounding-type receptacles shall be used and be connected to the equipment grounding conductor in accordance with 406.12(C) or 250.130(C).

(2) Non-Grounding-Type Receptacles.

Where attachment to equipment grounding conductors does not exist in receptacle enclosures, the installation shall comply with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)(2) (c).

(a) Non-grounding-type receptacles shall be permitted to be replaced with other non-grounding-type receptacles.

(b) Non-grounding-type receptacles shall be permitted to be replaced with ground-fault circuit interrupter-type receptacles. These receptacles or their cover plates shall be marked "No Equipment Ground." Equipment grounding conductors shall not be connected from the ground-fault circuit-interrupter-type receptacles to any outlets supplied from the ground-fault circuit-interrupter receptacles.

(c) Non-grounding-type receptacles shall be permitted to be replaced with grounding-type receptacles where supplied through ground-fault circuit interrupters. Where grounding-type receptacles are supplied through ground-fault circuit interrupters, grounding-type receptacles or their cover plates shall be marked "GFCI Protected" and "No Equipment Ground," visible after installation. Equipment grounding conductors shall not be connected between the grounding-type receptacles.

Informational Note No. 1: Some equipment or appliance manufacturers require that the branch circuit to the equipment or appliance includes an equipment grounding conductor.

Informational Note No. 2: See 250.114 for a list of cord- and plug-connected equipment or appliances that require equipment grounding conductors.

(3) Ground-Fault Circuit-Interrupter Protection.

Ground-fault circuit-interrupter protection for receptacles shall be provided where replacements are made at receptacle outlets that are required to be so protected elsewhere in this code.

Exception: The receptacle shall be permitted to be replaced with a new receptacle of the existing type, where GFCI protection is provided and the receptacle is marked "GFCI Protected" and "No Equipment Ground," in accordance with 406.12(D)(2)(a), 406.12(D)(2) (b), or 406.12(D)(2)(c), as applicable, where all of the following conditions exist:

- (1) The outlet box size will not permit the installation of the GFCI receptacle.
- (2) No electrically upstream outlet box will permit the installation of a GFCI receptacle.
- (3) A GFCI circuit breaker cannot provide the required GFCI protection.
- (4) Arc-Fault Circuit-Interrupter Protection.

If a receptacle supplied by a 120-volt, single-phase, 15- or 20-ampere branch circuit located in any areas specified in 210.12(B), 210.12(C), or 210.12(D) is replaced, a replacement receptacle at this outlet shall be one of the following:

- (1) A listed outlet branch-circuit type AFCI receptacle
- (2) A receptacle protected by a listed outlet branch-circuit type AFCI type receptacle
- (3) A receptacle protected by a listed combination type AFCI circuit breaker

Exception: Section 210.12(E) Exception shall not apply to replacement of receptacles.

(5) Tamper-Resistant Receptacles.

Listed tamper-resistant receptacles shall be provided where replacements are made at receptacle outlets that are required to be tamper-resistant elsewhere in this code, except in one of the following cases:

- (1) Where nongrounding receptacles are replaced with other nongrounding receptacles
- (2) Where aluminum branch-circuit conductors are directly terminated on CO/ALR receptacles, installed as replacements
- (6) Weather-Resistant Receptacles.

Weather-resistant receptacles shall be provided where replacements are made at receptacle outlets that are required to be so protected elsewhere in this code.

(7) Controlled Receptacles.

Automatically controlled receptacles shall be replaced with equivalently controlled receptacles. If automatic control is no longer required, such receptacles and any associated receptacles marked in accordance with 406.11(D) shall be replaced with receptacles and faceplates not marked in accordance with 406.11(D).

(8) Ground-Fault Protection of Equipment (GFPE).

Receptacles shall be provided with ground-fault protection of equipment (GFPE) where replacements are made at receptacle outlets that are required to be so protected elsewhere in this code.

(E) Cord- and Plug-Connected Equipment.

The installation of grounding-type receptacles shall not be used as a requirement that all cordand plug-connected equipment be of the grounded type.

Informational Note: See 250.114 for types of cord- and plug-connected equipment to be grounded.

(F) Noninterchangeable Types.

Receptacles connected to circuits that have different voltages, frequencies, or types of current (ac or dc) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(G) Protection of Floor Receptacles.

Protection for floor receptacles shall comply with the following:

- (1) Physical protection of floor receptacles shall allow floor-cleaning equipment to be operated without damage to receptacles.
- (2) All 125-volt, single-phase, 15- and 20-ampere floor receptacles installed in food courts and waiting spaces of passenger transportation facilities shall be GFCI protected.

406.14 Receptacle Mounting.

Receptacles shall be mounted in identified boxes or assemblies. Boxes or assemblies shall be securely fastened in place unless otherwise permitted elsewhere in this code. Screws used for the purpose of attaching receptacles to boxes shall be of the type provided with listed receptacles, or be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions.

(A) Boxes That Are Set Back.

Receptacles mounted in boxes that are set back from finished surfaces as permitted in 314.20 shall be installed such that the mounting yokes or straps of the receptacles are held rigidly at the finished surfaces.

(B) Boxes That Are Flush.

Receptacles mounted in boxes that are flush with finished surfaces or project therefrom shall be installed such that the mounting yokes or straps of the receptacles are held rigidly against the boxes or box covers.

(C) Receptacles Mounted on Covers.

Receptacles mounted to and supported by covers shall be held rigidly against the covers by more than one screw or be device assemblies or box covers listed and identified for securing by a single screw.

(D) Position of Receptacle Faces.

After installation, receptacle faces shall be flush with or project from faceplates of insulating material and project a minimum of 0.4 mm (0.015 in.) from metal faceplates.

Exception: Listed kits or assemblies encompassing receptacles and nonmetallic faceplates that cover the receptacle faces, where the plates cannot be installed on any other receptacles, shall be permitted.

(E) Receptacles in Countertops.

Receptacle assemblies for installation in countertop surfaces shall be listed for countertop applications. Where receptacle assemblies for countertop applications are required to provide ground-fault circuit-interrupter protection for personnel in accordance with 210.8, such assemblies shall be permitted to be listed as GFCI receptacle assemblies for countertop applications.

(F) Receptacles in Work Surfaces.

Receptacle assemblies and GFCI receptacle assemblies listed for work surface or countertop applications shall be permitted to be installed in work surfaces.

(G) Receptacle Orientation.

Receptacles shall not be installed in a face-up position in any of the following locations:

- (1) In or on countertop surfaces or work surfaces unless listed for countertop or work surface applications
- (2) In the area below a sink
- (3) In a laundry area, unless permitted by 406.14(G)(1)

(H) Receptacles in Seating Areas and Other Similar Surfaces.

In seating areas or similar surfaces, receptacles shall not be installed in a face-up position unless the receptacles are any of the following:

- (1) Part of an assembly listed as a furniture power distribution unit
- (2) Part of an assembly listed either as household furnishings or as commercial furnishings
- (3) Listed either as a receptacle assembly for countertop applications or as a GFCI receptacle assembly for countertop applications
- (4) Installed in a listed floor box
- (I) Exposed Terminals.

Receptacles shall be enclosed so that live wiring terminals are not exposed to contact.

(J) Voltage Between Adjacent Devices.

Receptacles shall not be grouped or ganged in enclosures with other receptacles, snap switches, or similar devices unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts or unless they are installed in enclosures equipped with identified, securely installed barriers between adjacent devices.

406.16 Receptacle Faceplates (Cover Plates).

Receptacle faceplates shall be installed to completely cover openings and seat against mounting surfaces.

Receptacle faceplates mounted inside boxes having recess-mounted receptacles shall effectively close openings and seat against mounting surfaces.

(A) Thickness of Metal Faceplates.

Metal faceplates shall be of ferrous metal not less than 0.76 mm (0.030 in.) in thickness or of nonferrous metal not less than 1.02 mm (0.040 in.) in thickness.

(B) Grounding.

Metal faceplates shall be grounded.

(C) Faceplates of Insulating Material.

Faceplates of insulating material shall comply with the following:

- (1) They shall be noncombustible.
- (2) They shall not be less than 2.54 mm (0.10 in.) in thickness unless formed or reinforced to provide adequate mechanical strength.
- (D) Receptacle Faceplates (Cover Plates) with Integral Night Lights, USB Chargers, or Both.

Flush device faceplates (cover plates) that integrally incorporate night lights, Class 2 output connectors (USB chargers), or both shall comply with all of the following:

- (1) Faceplate (cover plate) assemblies shall be listed.
- (2) During normal operation, night light and Class 2 supply connections shall not introduce current to the grounding means or to the equipment grounding conductor.
- (3) Night lights and Class 2 connections (USB chargers), if relying on spring-tensioned contacts for electrical power, shall comply with the following:
 - a. They shall not be rated more than 1 watt.
 - b. They shall be connected to only unpainted or unenameled heads of receptacle terminal screws made only of copper alloy unless the faceplate (cover plate) is additionally listed and identified that the spring-tensioned contacts are suitable for connection to unpainted or unenameled heads of terminal screws made of plated steel.
- 406.18 Attachment Plugs, Cord Connectors, and Flanged Surface Devices.

All attachment plugs, cord connectors, and flanged surface devices (inlets and outlets) shall be marked with the manufacturer's name or identification and voltage and ampere ratings.

(A) Construction of Attachment Plugs and Cord Connectors.

Attachment plugs and cord connectors shall be constructed so that there are no exposed current-carrying parts except the prongs, blades, or pins. The cover for wire terminations shall be a part that is essential for the operation of attachment plugs or connectors (dead-front construction).

(B) Connection of Attachment Plugs.

Attachment plugs shall be installed so that their prongs, blades, or pins are not energized unless inserted into energized receptacles or cord connectors. No receptacle shall be installed so as to require the insertion of an energized attachment plug as its source of supply.

(C) Attachment Plug Ejector Mechanisms.

Attachment plug ejector mechanisms shall not adversely affect engagement of the blades of attachment plugs with the contacts of receptacles.

(D) Flanged Surface Inlet.

Flanged surface inlets shall be installed such that the prongs, blades, or pins are not energized unless energized cord connectors are inserted into them.

406.19 Grounding-Type Receptacles, Adapters, Cord Connectors, and Attachment Plugs.

(A) Grounding Poles (Connections).

Grounding-type receptacles, cord connectors, and attachment plugs shall be provided with one fixed grounding pole in addition to the circuit poles. The grounding contacting pole of grounding-type plug-in ground-fault circuit interrupters shall be permitted to be of the movable, self-restoring type on circuits operating at not over 150 volts between any two conductors or any conductor and ground.

(B) Grounding-Pole (Connection) Identification.

Grounding-type receptacles, adapters, cord connections, and attachment plugs shall have a means for connection of an equipment grounding conductor to the grounding pole.

A terminal for connection to the grounding pole shall be designated by one of the following:

- (1) A green-colored hexagonal-headed or -shaped terminal screw or nut, not readily removable
- (2) A green-colored pressure wire connector body (a wire barrel)
- (3) A similar green-colored connection device, in the case of adapters, as follows:
 - a. The grounding terminal of a grounding adapter shall be a green-colored rigid ear, lug, or similar device.
 - b. The equipment grounding connection shall be designed such that it cannot make contact with current-carrying parts of the receptacle, adapter, or attachment plug.
 - c. The adapter shall be polarized.
- (4) If the terminal for the equipment grounding conductor is not visible, as follows:
 - a. The conductor entrance hole shall be marked with the word *green* or *ground*, the letters *G* or *GR*, a grounding symbol, or otherwise identified by a distinctive green color.
 - b. If the terminal for the equipment grounding conductor is readily removable, the area adjacent to the terminal shall be similarly marked.

Informational Note: See Figure Informational Note 406.19(B).

Figure Informational Note 406.19(B) Example of Symbol Used to Identify Termination Point for an Equipment Grounding Conductor.



(C) Grounding Terminal Use.

Grounding terminals shall not be used for purposes other than connection to equipment grounding conductors.

(D) Grounding-Pole (Connection) Requirements.

Grounding-type attachment plugs and mating cord connectors and receptacles shall be designed such that the equipment grounding connection is made before current-carrying connections. Grounding-type devices shall be designed such that grounding poles of attachment plugs cannot be brought into contact with current-carrying parts of receptacles or cord connectors.

(E) Use.

Grounding-type attachment plugs shall be used only with cords having equipment grounding conductors.

Informational Note: See 250.126 for identification of equipment grounding conductor terminals.

406.20 Noninterchangeability.

Receptacles, cord connectors, and attachment plugs shall be constructed such that receptacle or cord connectors do not accept attachment plugs with different voltages or current ratings from that for which the devices are intended. However, 20-ampere T-slot receptacles or cord connectors shall be permitted to accept 15-ampere attachment plugs of the same voltage rating. Non-grounding-type receptacles and connectors shall not accept grounding-type attachment plugs.

406.24 Connecting Receptacle Grounding Terminal to Box.

Connection of receptacle grounding terminals shall comply with 250.146.

406.26 Tamper-Resistant Receptacles.

All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the following locations shall be listed tamper-resistant receptacles:

- (1) All dwelling units, boathouses, mobile homes and manufactured homes, including their attached and detached garages, accessory buildings, and common areas
- (2) Guest rooms and guest suites of hotels, motels, and their common areas
- (3) Child care facilities
- (4) Preschools and education facilities
- (5) Within clinics, medical and dental offices, and outpatient facilities, the following spaces:
 - a. Business offices accessible to the general public
 - b. Lobbies and waiting spaces
 - c. Spaces of nursing homes and limited care facilities covered in 517.10(B)(2)
- (6) Places of awaiting transportation, gymnasiums, skating rinks, fitness centers, and auditoriums
- (7) Dormitories
- (8) Residential care/assisted living facilities, social and substance abuse rehabilitation facilities, and group homes
- (9) Foster care facilities, nursing homes, and psychiatric hospitals
- (10) Areas of agricultural buildings accessible to the general public and any common areas
- (11) Park and recreation areas

Informational Note No. 1: See ANSI/NEMA WD 6-2016, *Wiring Devices* — *Dimensional Specifications*. This requirement would include receptacles identified as 5-15, 5-20, 6-15, and 6-20.

Informational Note No. 2: See NFPA 5000-2024, *Building Construction and Safety Code*, and the *International Building Code* (IBC)-2021 for more information on occupancy classifications for the types of facilities covered by this requirement.

Informational Note No. 3: Areas of agricultural building are frequently converted to hospitality areas. These areas can include petting zoos, stables, and buildings used for recreation or educational purposes where receptacles are installed.

Informational Note No. 4: Park and recreation areas can include garden areas, play areas, and similar areas.

Exception to (1) through (10): Receptacles in the following locations shall not be required to be tamper resistant:

- (1) Receptacles located more than 1.7 m (5 $\frac{1}{2}$ ft) above the floor
- (2) Receptacles that are part of a luminaire or appliance
- (3) Where the receptacle outlet is installed within the space occupied by or designated for each appliance that, in normal use, is not easily moved from one place to another and is cord-and-plug-connected in accordance with 400.10(A)(6), 400.10(A)(7), or 400.10(A)(8), the following are permitted:
 - a. A single receptacle that is not readily accessible and supplies one appliance
 - b. A duplex receptacle that is not readily accessible and supplies two appliances
- (4) Nongrounding receptacles used for replacements as permitted in 406.12(D)(2)(a)

406.28 Single-Pole Separable-Connector Type.

Single-pole separable connectors shall be listed and labeled and comply with 406.28(A) through 406.28(D).

(A) Locking or Latching Type.

Single-pole separable connectors shall be of either the locking or latching type and marked with the manufacturer's name or identification and voltage and ampere ratings.

(B) Identification.

Connectors designated for connection to grounded circuit conductors shall be identified by white-colored housing; connectors designated for connection to grounding circuit conductors shall be identified by green-colored housing.

(C) Interchangeability.

Single-pole separable connectors shall be permitted to be interchangeable for ac or dc use or for different current ratings or voltages on the same premises if they are listed for ac/dc use and marked in a suitable manner to identify the system to which they are intended to be connected.

(D) Connecting and Disconnecting.

The use of single-pole separable connectors shall be performed by qualified persons and comply with at least one of the following conditions:

- (1) Connection and disconnection of connectors is only possible where the supply connectors are interlocked to the source, and it is not possible to connect or disconnect connectors when the supply is energized.
- (2) Line connectors are of the listed sequential-interlocking type so that load connectors are connected in the following sequence and that disconnection is in the reverse sequence:
 - a. Equipment grounding conductor connection
 - b. Grounded circuit conductor connection, if provided
 - c. Ungrounded conductor connection
- (3) A caution notice that complies with 110.21(B) is provided on the equipment employing single-pole separable connectors, adjacent to the line connectors, indicating that connections are to be performed in the following sequence and that disconnection is in the reverse sequence:
 - a. Equipment grounding conductor connectors
 - b. Grounded circuit-conductor connectors, if provided
 - c. Ungrounded conductor connectors

Informational Note: See ANSI-UL 1691-2014, *Single Pole Locking-Type Separable Connectors*, for more information on single-pole locking-type separable connectors.

Part III. General-Use Snap Switches, Dimmers, and Electronic Control Switches

406.30 Switch Connections.

(A) Three-Way and Four-Way Switches.

Three-way and four-way switches shall be wired so that all switching is done only in ungrounded circuit conductors. Where in metal raceways or metal-armored cables, wiring between switches and outlets shall comply with 300.22(A).

Exception: Switch loops shall not require a grounded conductor.

(B) Grounded Conductors.

Switches or circuit breakers shall not disconnect the grounded conductors of circuits.

Exception: A switch or circuit breaker shall be permitted to disconnect a grounded circuit conductor where all circuit conductors are disconnected simultaneously, or where the device is arranged so that the grounded conductor cannot be disconnected until all the ungrounded conductors of the circuit have been disconnected.

(C) Switches Controlling Lighting Loads.

The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded generalpurpose branch circuit serving bathrooms, hallways, stairways, and habitable rooms or occupiable spaces as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations:

- (1) Where conductors enter the box enclosing the switch through a raceway if the raceway is large enough for all contained conductors, including a grounded conductor
- (2) Where snap switches with integral enclosures comply with 300.17(E)
- (3) Where lighting in the area is controlled by automatic means
- (4) Where a switch controls a receptacle load

The grounded conductor shall be extended to any switch location as necessary, be connected to switching devices that require line-to-neutral voltage to operate the electronics of the switch in the standby mode, and meet the requirements of 406.50.

Exception: The connection requirement shall not apply to replacement or retrofit switches installed in locations prior to local adoption of 406.30(C) and where the grounded conductor cannot be extended without removing finish materials. The number of electronic control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25. For the purpose of this exception, a neutral busbar, in compliance with 200.4(B) and to which a main or system bonding jumper is connected, shall not be limited as to the number of electronic lighting control switches connected.

Informational Note: The provision for a grounded conductor is to complete a circuit path for electronic lighting control devices.

406.32 Switch Enclosures.

Switches shall be of the externally operable type installed in device boxes or on covers listed for the intended use.

Exception: Pendant- and surface-type snap switches mounted on open-face switchboards or panelboards shall be permitted without enclosures.

406.34 Time Switches, Flashers, and Similar Devices.

Time switches, flashers, and similar devices shall be of the enclosed type or be installed in device boxes.

406.36 Indicating.

General-use and motor circuit switches where mounted in enclosures as described in 406.32 shall indicate, in locations that are visible when accessing the external operation means, whether they are in the open (off) or closed (on) position.

Exception: Vertically operated double-throw switches shall be permitted to be in the closed (on) position with the handle in either the up or down position.

406.38 Accessibility and Grouping.

(A) Location.

All switches and circuit breakers used as switches shall comply with the following:

- (1) They shall be located so that they can be operated from readily accessible places.
- (2) They shall be installed such that the center of the grip of the operating handle of the switch or circuit breaker, when in its highest position, is not more than 2.0 m (6 ft 7 in.) above the floor or working platform, except as follows:
 - a. On busway installations, fused switches and circuit breakers shall be permitted to be located at the same level as the busway if suitable means is provided to operate the handle of the device from the floor.
 - b. Switches and circuit breakers installed adjacent to motors, appliances, or other equipment that they supply shall be permitted to be located higher than 2.0 m (6 ft 7 in.) and to be accessible by portable means.
 - c. Hookstick operable isolating switches shall be permitted at greater heights.
- (B) Voltage Between Adjacent Devices.

Snap switches shall not be grouped or ganged in enclosures with other snap switches, receptacles, or similar devices unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts, or unless they are installed in enclosures equipped with identified, securely installed barriers between adjacent devices.

(C) Multipole Snap Switches.

Multipole, general-use snap switches shall not be fed from more than a single circuit unless they are listed and marked as two-circuit or three-circuit switches.

Informational Note: See 210.7 for disconnect requirements where more than one circuit supplies a switch.

406.40 General-Use Snap Switches, Dimmers, and Control Switches.

(A) Faceplate (Cover Plate) Mounting.

Faceplates provided for snap switches, dimmers, and control switches mounted in boxes and other enclosures shall be installed to completely cover the opening and, where the switch is flush mounted, seat against the finished surface.

Faceplates that are installed on receptacles mounted on the same box as snap switches, dimmers, and control switches shall comply with 406.14(C), 406.14(D), 406.16, and, as applicable, 406.9.

(B) Grounding.

Snap switches, dimmers, and control switches shall be connected to an equipment grounding conductor and provide a means to connect metal faceplates to the equipment grounding conductor, whether or not metal faceplates are installed. Metal faceplates shall be bonded to the equipment grounding conductor. Snap switches, dimmers, control switches, and metal faceplates shall be connected to equipment grounding conductors using either of the following methods:

- (1) The switch is mounted with metal screws to a metal box or metal cover that is connected to an equipment grounding conductor or to a nonmetallic box with integral means for connecting to an equipment grounding conductor.
- (2) An equipment grounding conductor or equipment bonding jumper is connected to an equipment grounding termination of the snap switch.

Exception No. 1: Where no means exists within the enclosure for bonding to the equipment grounding conductor, or where the wiring method does not include or provide an equipment grounding conductor, a snap switch without a connection to an equipment grounding conductor shall be permitted for replacement purposes only. A snap switch wired under the provisions of this exception and located within 2.5 m (8 ft) vertically, or 1.5 m (5 ft) horizontally, of ground or exposed grounded metal objects shall be provided with a faceplate of nonconducting noncombustible material with nonmetallic attachment screws, unless the switch mounting strap or yoke is nonmetallic or the circuit is protected by a ground-fault circuit interrupter.

Exception No. 2: Listed kits or listed assemblies shall not be required to be bonded to an equipment grounding conductor if all of the following conditions are met:

- (1) The device is provided with a nonmetallic faceplate, and the device is designed such that no metallic faceplate replaces the one provided.
- (2) The device does not have mounting means to accept other configurations of faceplates.
- (3) The device is equipped with a nonmetallic yoke.
- (4) All parts of the device that are accessible after installation of the faceplate are manufactured of nonmetallic materials.

Exception No. 3: A snap switch with an integral nonmetallic enclosure complying with 300.17(E) shall be permitted without a bonding connection to an equipment grounding conductor.

(C) Faceplate (Cover Plate) Construction.

Metal faceplates shall be constructed of ferrous metal not less than 0.76 mm (0.030 in.) in thickness or of nonferrous metal not less than 1.02 mm (0.040 in.) in thickness. Faceplates of insulating material shall be noncombustible and be not less than 2.54 mm (0.100 in.) in thickness unless formed or reinforced to provide adequate mechanical strength.

(D) Faceplates (Cover Plates) Incorporating Night Lights, USB Chargers, or Both.

For snap switches, dimmers, and control switches, faceplates (cover plates) that integrally incorporate night lights Class 2 connections (USB chargers), or both shall comply with all the following:

- (1) Faceplate (cover plate) assemblies shall be listed.
- (2) During normal operation, night lights and Class 2 connections (USB chargers) shall not introduce current to the bonding means or the equipment grounding conductors.
- (3) Electrical power supply connections to night lights and Class 2 connections (USB chargers) shall not be connected across the line and load terminals of snap switches, dimmers, and control switches having a marked OFF position.
- (4) Night lights and Class 2 connections (USB chargers), if relying on spring-tensioned contacts for electrical power, shall comply with the following:
 - a. They shall not be rated more than 1 watt.
 - b. They shall be connected to only unpainted or unenameled heads of switch terminal screws made of only copper alloy unless the faceplate (cover plate) is additionally listed and identified that the spring-tensioned contacts are suitable for connection to unpainted or unenameled heads of terminal screws made of steel.

406.42 Mounting of General-Use Snap Switches, Dimmers, and Control Switches.

(A) Surface Type.

General-use snap switches, dimmers, and control switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least 13 mm ($\frac{1}{2}$ in.) from the surface wired over.

(B) Box Mounted.

Flush-type general-use snap switches, dimmers, and control switches mounted in boxes that are set back of the finished surface as permitted in 314.20 shall be installed so that the extension plaster ears are seated against the surface. Flush-type devices mounted in boxes that are flush with the finished surface or project from it shall be installed so that the mounting yoke or strap of the device is seated against the box. Screws used for the purpose of attaching a device to a box shall either be of the type provided with a listed device, or be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions.

406.44 Grounding of Enclosures.

Metal enclosures for switches shall be connected to equipment grounding conductors as specified in Article 250, Part IV. Metal enclosures for switches used as service equipment shall comply with the requirements of Article 250, Part V. Where nonmetallic enclosures are used with metal raceways or metal-armored cables, they shall comply with 314.3 Exception No. 1 or No. 2.

Except as covered in 406.40(B) Exception No. 1, nonmetallic boxes for switches shall be installed with a wiring method that provides or includes an equipment grounding conductor.

406.46 Rating and Use of Switches.

Switches shall be marked with their ratings.

- Informational Note No. 1: See 600.6 for switches for signs and outline lighting.
- Informational Note No. 2: See 430.83, 430.109, and 430.110 for switches controlling motors.

(A) Alternating-Current General-Use Snap Switches.

Alternating-current general-use snap switches shall only be used on ac circuits and used for controlling the following:

- (1) Resistive and inductive loads not exceeding the ampere rating of the switch at the voltage applied
- (2) Tungsten-filament lamp loads not exceeding the ampere rating of the switch at 120 volts
- (3) Electric discharge lamp loads not exceeding the marked ampere and voltage rating of the switch
- (4) Motor loads not exceeding 80 percent of the ampere rating of the switch at its rated voltage
- (5) Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied
- (B) Alternating-Current or Direct-Current General-Use Snap Switches.

Alternating-current or direct-current general-use snap switches shall be permitted on either ac or dc circuits and used only for controlling the following:

- (1) Resistive loads not exceeding the ampere rating of the switch at the voltage applied.
- (2) Inductive loads not exceeding 50 percent of the ampere rating of the switch at the applied voltage. Switches rated in horsepower are suitable for controlling motor loads within their rating at the voltage applied.
- (3) Tungsten-filament lamp loads not exceeding the ampere rating of the switch at the applied voltage if T-rated.
- (4) Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding the ampere rating of the switch at the voltage applied.
- (C) Snap Switch Terminations.

Snap switch terminations shall comply with the following:

- (1) Copper, aluminum, and copper-clad aluminum conductors shall be permitted to terminate at the terminals of snap switches marked CO/ALR.
- (2) Only copper and copper-clad aluminum conductors shall be permitted to be terminated at the terminals of 15-ampere and 20-ampere snap switches not marked CO/ALR.
- (3) Snap switches connected using screwless terminals of conductor push-in type construction (also known as conductor push-in terminals) shall be installed on not greater than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only unless listed and marked for other types of conductors.

Informational Note: See UL 20-2018, *General-Use Snap Switches*, for information regarding screwless terminals of various voltage type constructions employed on snap switches. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 20 as screwless terminals of conductor push-in type construction (also known as conductor push-in terminals).

(D) Alternating-Current General-Use Snap Switches Rated for 347 Volts.

Alternating-current general-use snap switches shall not be rated less than 15 amperes at a voltage of 347 volts ac, and they shall not be readily interchangeable in box mounting with switches covered in 406.46(A) and 406.46(B). These switches shall be used only for controlling any of the following:

- (1) Noninductive loads other than tungsten-filament lamps not exceeding the ampere and voltage ratings of the switch.
- (2) Inductive loads not exceeding the ampere and voltage ratings of the switch. Where particular load characteristics or limitations are specified as a condition of the listing, those restrictions shall be observed, regardless of the ampere rating of the load.
- (3) Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied.
- (E) Dimmer and Electronic Control Switches.

General-use dimmer switches and electronic control switches, such as timing switches and occupancy sensors, shall be used only to control permanently connected loads, such as incandescent luminaires, unless listed for the control of other loads and installed accordingly. They shall be marked by their manufacturer with their current and voltage ratings and used for loads that do not exceed their ampere rating at the voltage applied.

(F) Cord- and-Plug-Connected Loads.

Where snap switches or control devices are used to control cord-and-plug-connected equipment on general-purpose branch circuits, each snap switch or control device controlling receptacle outlets or cord connectors that are supplied by permanently connected cord pendants shall be rated at not less than the rating of the maximum permitted ampere rating or setting of the overcurrent device protecting the receptacles or cord connectors, as provided in 210.21(B).

Informational Note: See 210.50(A) and 400.10(A)(1) for equivalency to a receptacle outlet of a cord connector that is supplied by a permanently connected cord pendant.

Exception: Where a snap switch or control device is used to control not more than one receptacle on a branch circuit, the switch or control device shall be permitted to be rated at not less than the rating of the receptacle.

406.48 Marking.

(A) Ratings.

Switches shall be marked with the current, voltage, and, if horsepower rated, the maximum rating for which they are designed.

(B) Off Indication.

Where in the off position, a switching device with a marked OFF position shall completely disconnect all ungrounded conductors to the load it controls.

406.50 Electronic Control Switches.

Electronic control switches shall not introduce current on the equipment grounding conductors during normal operation.

Exception: Electronic control switches that introduce current on equipment grounding conductors shall be permitted for applications covered by 406.30(C) Exception. Electronic control switches that introduce current on equipment grounding conductors shall be listed and marked for use in replacement or retrofit applications only.

Additional Proposed Changes

File NameDescriptionApprovedCN_50.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 50 appeared in the First Draft Report on First Revision No. 7914.

The Correlating Committee directs that CMP 18 review FR 7914 and reconsider the use of the parenthetical phrase throughout Article 406 as parenthetical expressions create confusion and misunderstanding and shall be avoided. Refer to NEC Style Manual Section 3.5.1.1. Additionally, the Correlating Committee directs that CMP 18 review the wording in 406.3 for "Reconditioned Equipment" and consider revising the text to align with recommended wording regarding reconditioning. The recommended wording is: "The installation of reconditioned wiring devices shall not be permitted."

Related Item

• First Revision No. 7914

Submitter Information Verification

Submitter Full Name	: CC Notes
Organization:	NEC Correlating Committee
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Jul 30 15:33:00 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7943-NFPA 70-2024</u>
Statement:	Parenthetical expressions have been removed and replaced in multiple clauses, for consistency with Style Manual Section 3.5.1.1.



Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:00:31 EDT 2024

Committee Statement

Committee The Correlating Committee directs that CMP 18 review FR 7914 and reconsider the use **Statement:** of the parenthetical phrase throughout Article 406 as parenthetical expressions create confusion and misunderstanding and shall be avoided. Refer to NEC Style Manual Section 3.5.1.1. Additionally, the Correlating Committee directs that CMP 18 review the wording in 406.3 for "Reconditioned Equipment" and consider revising the text to align with recommended wording regarding reconditioning. The recommended wording is: "The installation of reconditioned wiring devices shall not be permitted."

First Revision No. 7914-NFPA 70-2024 [Global Input]

Ballot Results

- This item has passed ballot
 - 12 Eligible Voters
 - 1 Not Returned
 - 11 Affirmative All
 - 0 Affirmative with Comments
 - 0 Negative with Comments
 - 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.
406.3 Rec	onditioned Equipment.
Recondition	ned wiring devices shall not be permitted to be <u>or</u> installed.
tatement of P	roblem and Substantiation for Public Comment
This public cor language in thi pertains to the existing langua if it is being ins being made. T	nment is made to address an issue with the first draft language changes. The propose s first revision allows electrical equipment to be reconditioned in place as the languag installation process and not to when any equipment is reconditioned in place. With the age in this first revision, the only time reconditioned equipment would not be permitted stalled. The Code does apply to existing equipment when additions or modifications ar he proposed language change from "installed" to "permitted" is more inclusive.
Rela	ted Item
• PI 3706 • PI 2	2607 • FR 7914
Submitter Ful	Name: Thomas Domitrovich
Organization	Eaton Corporation
Organization.	
Street Addres	S:
Street Addres City:	s:
Street Addres City: State: Zin:	s:
Street Addres City: State: Zip: Submittal Dat	s: Fri Aug 23 08:47:30 EDT 2024
Street Addres City: State: Zip: Submittal Dat Committee:	s: e: Fri Aug 23 08:47:30 EDT 2024 NEC-P18
Street Addres City: State: Zip: Submittal Dat Committee Sta	s: e: Fri Aug 23 08:47:30 EDT 2024 NEC-P18 tement
Street Addres City: State: Zip: Submittal Dat Committee Sta Committee Action:	s: e: Fri Aug 23 08:47:30 EDT 2024 NEC-P18 tement Rejected

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Public Co	omment No. 409-NFPA 70-2024 [Section No. 406.3]
406.3 Re	econditioned Equipment.
Reconditio	blied withing devices shall not be permitted to be installed.
Additional Pro	oposed Changes
File Name CN_52.pdf	Description Approved
Statement of F	Problem and Substantiation for Public Comment
NOTE: The fo	llowing CC Note No. 52 appeared in the First Draft Report on First Revision No. 8816.
The Correlatir parenthetical create confus 3.5.1.1. Additi manufacturer	ng Committee directs that CMP 18 review FR 8816 and reconsider the use of the phrase (also known as push-in-terminals) in 406.10(3), as parenthetical expressions ion and misunderstanding and shall be avoided. Refer to NEC Style Manual Section ionally, CMP 18 shall reconsider the need for including the statement "identified by the 's instructions" as this isa general requirement in 110.3.
First Revisio	n No. 8816
Submitter Info	rmation Verification
Submitter Fu	U Name: CC Notes
Submitter Fu	III Name: CC Notes
Street Addres	ss:
City:	
State:	
Zip:	
Submittal Da	te: Tue Jul 30 15:36:45 EDT 2024
Committee:	NEC-P18
Committee Sta	atement
Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7881-NFPA 70-2024</u>
Statement:	1214 & 263 These two comments add informational note No. 2 addressing UL 20 Snap Switches.
	1389 - Text was modified to positive language to differentiate devices intended for copper conductor only and those that are intended for both copper and copper-clad aluminum conductors. It should be noted that copper conductors and copper-clad aluminum conductors are not equivalent. Due to the different ampacity rating, see Table 310.16.
	718 – Informational note No. 2- i.e. UL 20 Snap Switches was added and provides

needed coordination. See committee action on PC 1213 & amp; PC 304. Additionally, parentheticals removed from (3) and informational note to comply with Style Manual Section 3.5.1.1.

739 Text was modified by changing "wires" to "conductor" for clarity. The other changes do not improve the text and meaning of the requirements.

409 Parenthetical phrase was removed "(also known as push-in-terminals) in 406.10(3)" to comply with the Style Manual 3.5.1.1.

"Manufacturer's instructions" was retained to assure that

"Proper conductor size and type" are essential for safe use when terminated to a Wiring Device. Not providing clear and concise language to the reader can potentially create a hazardous condition simply due to not knowing the proper conductor size (AWG) and type (ex. Copper only and Copper Clad Aluminum and Aluminum).

Correlating Committee Note No. 52-NFPA 70-2024 [Section No. 406.3]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:04:21 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 8816 and reconsider the use of the parenthetical phrase (also known as push-in-terminals) in 406.10(3), as parenthetical expressions create confusion and misunderstanding and shall be avoided. Refer to NEC Style Manual Section 3.5.1.1. Additionally, CMP 18 shall reconsider the need for including the statement "identified by the manufacturer's instructions" as this is a general requirement in 110.3.

First Revision No. 8816-NFPA 70-2024 [Section No. 406.3(D)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Comment No. 413-NFPA 70-2024 [Section No. 406.9(A)] (A) Damp Locations. (1) Receptacles. (a) General. Installations suitable for wet locations shall also be considered suitable for damp locations. Receptacles shall be considered to be in locations protected from the weather where located under roofed open porches, canopies, marquees, and similar and will not be subjected to beating rain or water runoff. (b) Weatherproof Enclosures. Receptacles installed outdoors in locations protected from the weather or in other damp locations shall have enclosures and covers for the receptacles that are weatherproof when the receptacles are covered (attachment plug caps not inserted and receptacle covers closed). (c) Weather-Resistant Receptacle Type. All 125- and 250-volt nonlocking receptacles shall be listed weather-resistant type. (d) Covers. Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the covers are not designed to open 90 degrees from the closed to open position. after installation. Informational Note: See ANSI/NEMA WD 6-2016, Wiring Devices — Dimensional *Specifications*, for the types of receptacles covered by this requirement. (2) Switches. Switches installed in damp locations shall comply with the following: (1) Surface-mounted switches shall be enclosed in weatherproof enclosures that comply with 312.2. (2) Flush-mounted switches shall be equipped with weatherproof covers. Additional Proposed Changes Description File Name **Approved** CN 55.pdf Statement of Problem and Substantiation for Public Comment NOTE: The following CC Note No. 55 appeared in the First Draft Report on First Revision No. 8820. The Correlating Committee directs that CMP 18 review FR 8820 and reconsider the use of the parenthetical phrase (attachment plug cap not inserted and receptacle covers closed) as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual

Section 3.5.1.1. Additionally, CMP 18 shall review the use of the phrase "and similar" in 406.9(A)(1)(a),

as the phrase is vague and unenforceable. Refer to the NEC Style Manual Section 3.5.4.

Related Item

First Revision No. 8820

Submitter Information Verification

Submitter Full Name: CC Notes		
Organization:	NEC Correlating Committee	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Tue Jul 30 15:47:34 EDT 2024	
Committee:	NEC-P18	

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7921-NFPA 70-2024</u>
Statement:	The language "and similar" was replaced with "and other water shedding structures that" to comply with Section 3.5.4 of Style Manual.
	The text of (b) Weatherproof Enclosures was revised to remove parenthetical phrase to comply with Section 3.5.1.1 of the Style Manual.
	"b" and "cover is closed and without an attachment plug cap inserted" to clarify the position of the plug and the cover

Correlating Committee Note No. 55-NFPA 70-2024 [Section No. 406.9(A)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:11:32 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 8820 and reconsider the use of the parenthetical phrase (attachment plug cap not inserted and receptacle covers closed) as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1. Additionally, CMP 18 shall review the use of the phrase "and similar" in 406.9(A)(1)(a), as the phrase is vague and unenforceable. Refer to the NEC Style Manual Section 3.5.4.

First Revision No. 8820-NFPA 70-2024 [Section No. 406.9(A)]

Ballot Results

- This item has passed ballot
 - 12 Eligible Voters
 - 1 Not Returned
 - 11 Affirmative All
 - 0 Affirmative with Comments
 - 0 Negative with Comments
 - 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.



- (1) Receptacles of 15 Amperes and 20 Amperes in a Wet Location.
- (a) Weatherproof Enclosure.

Receptacles of 15 amperes and 20 amperes, 125 volts and 250 volts installed in a wet location shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted.

(b) Outlet Box Hood.

An outlet box hood shall be identified as extra-duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood need not be identified as extra duty.

(c) Covers.

Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the cover is not designed to open 90 degrees from the closed to open position, after installation.

Informational Note: See ANSI/UL 514D–2016, *Cover Plates for Flush-Mounted Wiring Devices*, for extra-duty outlet box hoods. Extra duty identification and requirements are not applicable to listed receptacles, faceplates, outlet boxes, enclosures, or assemblies that are identified as either being suitable for wet locations or rated as one of the outdoor enclosure–type numbers of Table 110.28 that does not utilize an outlet box hood.

Exception: 15- and 20-ampere, 125- through 250-volt receptacles installed in a wet location and subject to routine high-pressure spray washing shall be permitted to have an enclosure that is weatherproof when the attachment plug is removed.

(d) Weather-Resistant Receptacle Type

All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles shall be listed and so identified as the weather-resistant type.

Informational Note: See ANSI/NEMA WD 6–2016, *Wiring Devices — Dimensional Specifications*, for receptacle configurations. The configuration of weather-resistant receptacles covered by this requirement are identified as 5-15, 5-20, 6-15, and 6-20.

Additional Proposed Changes

File Name Description Approved

CN_56.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 56 appeared in the First Draft Report on First Revision No. 8821.

The Correlating Committee directs that CMP 18 review FR 8821 regarding whether it was the intent of the CMP to remove the requirement for outlet box hoods to be listed, as that change was not noted in the Committee Statement.

Related Item

• First Revision No. 8821

Submitter Information Verification

Submitter Full Name:	CC Notes	
Organization:	NEC Correlating Committee	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Tue Jul 30 15:50:11 EDT 2024	
Committee:	NEC-P18	
Committee Statement		
Committee Reject	ed but see related SR	

Action:	
Resolution:	<u>SR-7922-NFPA 70-2024</u>
Statement:	There was no intention to remove listing requirement. The listing requirement needs to be maintained to coordinate with identified as extra-duty. Without "listed" and "identified" Outlet Box Hood could be self-declared as extra-duty.

Correlating Committee Note No. 56-NFPA 70-2024 [Section No. 406.9(B)(1)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:12:50 EDT 2024

Committee Statement

Committee The Correlating Committee directs that CMP 18 review FR 8821 regarding whether it was the intent of the CMP to remove the requirement for outlet box hoods to be listed, as that change was not noted in the Committee Statement.

First Revision No. 8821-NFPA 70-2024 [Section No. 406.9(B)(1)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Comment No. 1212-NFPA 70-2024 [Section No. 406.9(B)(1)(b)]

(b) Outlet Box Hood.

An outlet box hood <u>installed for this purpose</u> shall be <u>listed and</u> identified as extra-duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood need not be identified as extra duty.

Statement of Problem and Substantiation for Public Comment

The listing requirement needs to be maintained to coordinate with identified. Without "listed" an "identified" Outlet Box Hood could be self-declared as Extra-Duty.

The Panel may also want to consider moving this requirement to 406.2 with the following language:

406.2 Listing Requirements Wiring devices shall be listed. An outlet box hood for a weather-proof cover shall be listed and identified as extra-duty.

Related Item

• FR8821

Submitter Information Verification

Submitter Full Name:	Megan Hayes
Organization:	NEMA
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Sat Aug 17 01:59:10 EDT 2024
Committee:	NEC-P18

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7922-NFPA 70-2024</u>
Statement:	There was no intention to remove listing requirement. The listing requirement needs to be maintained to coordinate with identified as extra-duty. Without "listed" and "identified" Outlet Box Hood could be self-declared as extra-duty.

Public Comment No. 416-NFPA 70-2024 [Section No. 406.9(B)(2)]

(2) Other Receptacles.

All other receptacles installed in wet locations shall be listed weather-resistant type and be installed in accordance with 406.9(B)(2)(a) or 406.9(B)(2)(b).

(a) For supplying a product that is unattended while in use, the receptacle shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed.

(b) For supplying a product that is attended while in use (e.g., portable tools), the receptacle shall have an enclosure that is weatherproof when the attachment plug is removed.

Additional Proposed Changes

File NameDescriptionApprovedCN_57.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 57 appeared in the First Draft Report on First Revision No. 8822.

The Correlating Committee directs that CMP 18 review FR 8822 and reconsider the use of the parenthetical phrase (e.g., portable tools) that may cause confusion or misunderstanding. See the NEC Style Manual Section 3.5.1.1.

Related Item

• First Revision No. 8822

Submitter Information Verification

Submitter Full Name: CC Notes		
Organization:	NEC Correlating Committee	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Tue Jul 30 15:51:33 EDT 2024	
Committee:	NEC-P18	

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7923-NFPA 70-2024</u>
Statement:	Parenthetical phrase (e.g., portable tools) to comply with Section 3.5.1.1 of the Style Manual.
	For supplying a product that is attended while in use "portable tools" was removed to

avoid confusion or misunderstanding and is already covered by the text "supplying a product".

Correlating Committee Note No. 57-NFPA 70-2024 [Section No. 406.9(B)(2)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:14:16 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 8822 and reconsider the use of the parenthetical phrase (e.g., portable tools) that may cause confusion or misunderstanding. See the NEC Style Manual Section 3.5.1.1.

First Revision No. 8822-NFPA 70-2024 [Section No. 406.9(B)(2)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Publi	ic Comment No. 1214-NFPA 70-2024 [Section No. 406.10]
406.1	10 Wiring Device Terminations.
Wiring	g device terminations shall comply with the following:
(1) V c (1	Viring devices marked CO/ALR shall be permitted to directly terminate aluminum, copper, or copper-clad aluminum conductors in accordance with the branch-circuit conductor size AWG) identified by the manufacturer's instructions.
(2) F	For wiring devices not marked CO/ALR, the following shall apply:
(3) <u>They shall not be permitted to directly terminate aluminum conductors.</u>
(4) <u>They shall be permitted to terminate directly to conductors other than aluminum in accordance with the branch-circuit conductor size (AWG) and type identified in the manufacturer's instruction.</u>
(5) V (1	Viring devices installed using screwless terminals of conductor push-in type construction also known as <i>push-in-terminals</i>) shall be installed on not greater than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only.
	Informational Note <u>No. 1</u> : See UL 498-2017, <i>Attachment Plugs and Receptacles</i> , for information regarding screwless terminals of various type constructions employed on receptacles. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 498 as screwless terminals of conductor push-in type construction (also known as push-in terminals).
	Informational Note No. 2: See UL 20-2018, General-Use Snap Switches, for information regarding screwless terminals of various voltage type constructions employed on snap switches. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 20 as screwless terminals of conductor push-in type construction (also known as conductor push-in terminals).
Statement As result Subsecti Informati	of Problem and Substantiation for Public Comment of relocating general use snap switches into section 406 under new title of "Wiring Devices". on 406.10, in Part 1. General, now applies generally to all wiring devices. This proposal adds onal Note regarding UL 20 for completeness.
There is terminati now unn	a companion public comment to delete the new subsection 406.46 (C) covering switch ons, which is ecessary.
The two	proposals will resolve the correlation concern expressed by the Correlating Committee
Related Pu	ublic Comments for This Document
Public C Public C • FR7872	Related CommentRelationshipComment No. 1213-NFPA 70-2024 [Section No. 406.46(C)]Comment No. 1213-NFPA 70-2024 [Section No. 406.46(C)]Related Item2

Submitter Information Verification

Submitter Full Name: Megan Hayes		
Organization:	NEMA	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Sat Aug 17 02:11:18 EDT 2024	
Committee:	NEC-P18	

Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7881-NFPA 70-2024</u>	
Statement:	1214 & 263 These two comments add informational note No. 2 addressing UL 20 Snap Switches.	
	1389 - Text was modified to positive language to differentiate devices intended for copper conductor only and those that are intended for both copper and copper-clad aluminum conductors. It should be noted that copper conductors and copper-clad aluminum conductors are not equivalent. Due to the different ampacity rating, see Table 310.16.	
	718 – Informational note No. 2- i.e. UL 20 Snap Switches was added and provides needed coordination. See committee action on PC 1213 & amp; PC 304. Additionally, parentheticals removed from (3) and informational note to comply with Style Manual Section 3.5.1.1.	
	739 Text was modified by changing "wires" to "conductor" for clarity. The other changes do not improve the text and meaning of the requirements.	
	409 Parenthetical phrase was removed "(also known as push-in-terminals) in 406.10(3)" to comply with the Style Manual 3.5.1.1.	
	"Manufacturer's instructions" was retained to assure that	
	"Proper conductor size and type" are essential for safe use when terminated to a Wiring Device. Not providing clear and concise language to the reader can potentially create a hazardous condition simply due to not knowing the proper conductor size (AWG) and type (ex. Copper only and Copper Clad Aluminum and Aluminum).	

Public Comment No. 1389-NFPA 70-2024 [Section No. 406.10]

406.10 Wiring Device Terminations.

Wiring device terminations shall comply with the following:

- (1) Wiring devices marked CO/ALR shall be permitted to directly terminate aluminum, copper, or copper-clad aluminum conductors in accordance with the branch-circuit conductor size (AWG) identified by the manufacturer's instructions.
- (2) For wiring devices not marked CO/ALR, the following shall apply:
 - (3) <u>They shall not be permitted to directly terminate aluminum conductors.</u>
 - (4) <u>They shall be permitted to terminate directly to conductors other than aluminum</u>, <u>including copper-clad aluminum conductors</u>, <u>in accordance with the branch-circuit</u> <u>conductor size (AWG) and type identified in the manufacturer's instruction</u>.
- (5) Wiring devices installed using screwless terminals of conductor push-in type construction (also known as *push-in-terminals*) shall be installed on not greater than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only.

Informational Note: See UL 498-2017, *Attachment Plugs and Receptacles*, for information regarding screwless terminals of various type constructions employed on receptacles. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 498 as screwless terminals of conductor push-in type construction (also known as push-in terminals).

Statement of Problem and Substantiation for Public Comment

During the First Draft meeting, this section was improved greatly. However, upon reflection, 406.10 (2) b. is potentially ambiguous to a person new to the code with regard to copper clad aluminum conductors. The proposed modification makes it very clear what was discussed by the panel - "conductors other than aluminum" means copper and copper-clad aluminum but NOT aluminum conductors. A novice reader could think that because copper clad aluminum conductors have aluminum in them, that they are not permitted.

Related Item

• FR-8816

Submitter Information Verification

Submitter Full Name: Jason Potterf		
Organization:	Cisco	
Affiliation:	ESTA	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Wed Aug 21 18:13:43 EDT 2024	
Committee:	NEC-P18	

Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7881-NFPA 70-2024</u>	
Statement:	1214 & 263 These two comments add informational note No. 2 addressing UL 20 Snap Switches.	
	1389 - Text was modified to positive language to differentiate devices intended for copper conductor only and those that are intended for both copper and copper-clad aluminum conductors. It should be noted that copper conductors and copper-clad aluminum conductors are not equivalent. Due to the different ampacity rating, see Table 310.16.	
	718 – Informational note No. 2- i.e. UL 20 Snap Switches was added and provides needed coordination. See committee action on PC 1213 & amp; PC 304. Additionally, parentheticals removed from (3) and informational note to comply with Style Manual Section 3.5.1.1.	
	739 Text was modified by changing "wires" to "conductor" for clarity. The other changes do not improve the text and meaning of the requirements.	
	409 Parenthetical phrase was removed "(also known as push-in-terminals) in 406.10(3)" to comply with the Style Manual 3.5.1.1.	
	"Manufacturer's instructions" was retained to assure that	
	"Proper conductor size and type" are essential for safe use when terminated to a Wiring Device. Not providing clear and concise language to the reader can potentially create a hazardous condition simply due to not knowing the proper conductor size (AWG) and type (ex. Copper only and Copper Clad Aluminum and Aluminum).	

40	6.10 Wiring Device Terminations.
₩ir	ing device terminations shall comply with the following:
(1)	Wiring devices marked CO/ALR shall be permitted to directly terminate aluminum, copper or copper-clad aluminum conductors in accordance with the branch-circuit conductor size (AWG) identified by the manufacturer's instructions.
(2)	For wiring devices not marked CO/ALR, the following shall apply:
	(3) They shall not be permitted to directly terminate aluminum conductors.
	(4) They shall be permitted to terminate directly to conductors other than aluminum in accordance with the branch-circuit conductor size (AWG) and type identified in the manufacturer's instruction.
Info	pranch circuits and be connected with 14 AWG solid copper wire only.
	Informational Note No. 2: See UL 20-2018, <u>General-Use Snap Switches</u> , for information regarding screwless terminals of various voltage type constructions employed on
rec	ceptacles
	<u>snap switches . Screwless terminals of separable-terminal assembly, spring-action</u> <u>clamp, and insulation-displacement type constructions are not classified in</u>
UL	498
	III. 20 as screwless terminals of conductor push-in type construction (also known as

Section 406.10 is in Part I (GENERAL) and therefore applies to all wiring devices, including generaluse snap switches. This comment relocates an Informational Note that is currently in 406.46 (which will be numbered Informational Note No. 2, resulting in the current Informational Note to be numbered Note No. 1). Another option would be to combine informational notes 1 and 2 since the topic is similar. There is a companion public comment to delete the new subsection 406.46 (C) covering switch terminations, which is now unnecessary.

The two proposals will resolve the correlation concern expressed by the Correlating Committee Note:11.

Note: This Public Comment is to only relocate Informational Note No. 2. While changes appear for items (2)(a) and (2)(b), that underlined text is an artifact of TerraView and is not part of this Public Comment.

Related Item

• CC note 11

Submitter Information Verification

Submitter Full Name: Charles Kurten		
Organization:	UL Solutions	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Fri Jul 26 12:58:56 EDT 2024	
Committee:	NEC-P18	

Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7881-NFPA 70-2024</u>	
Statement:	1214 & 263 These two comments add informational note No. 2 addressing UL 20 Snap Switches.	
	1389 - Text was modified to positive language to differentiate devices intended for copper conductor only and those that are intended for both copper and copper-clad aluminum conductors. It should be noted that copper conductors and copper-clad aluminum conductors are not equivalent. Due to the different ampacity rating, see Table 310.16.	
	718 – Informational note No. 2- i.e. UL 20 Snap Switches was added and provides needed coordination. See committee action on PC 1213 & amp; PC 304. Additionally, parentheticals removed from (3) and informational note to comply with Style Manual Section 3.5.1.1.	
	739 Text was modified by changing "wires" to "conductor" for clarity. The other changes do not improve the text and meaning of the requirements.	
	409 Parenthetical phrase was removed "(also known as push-in-terminals) in 406.10(3)" to comply with the Style Manual 3.5.1.1.	
	"Manufacturer's instructions" was retained to assure that	
	"Proper conductor size and type" are essential for safe use when terminated to a Wiring Device. Not providing clear and concise language to the reader can potentially create a hazardous condition simply due to not knowing the proper conductor size (AWG) and type (ex. Copper only and Copper Clad Aluminum and Aluminum).	

	Public Comment No.	718-NFPA 70-2024	[Section No.	406.10]
IFPA				

406.10 Wiring Device Terminations.

Wiring device terminations shall comply with the following:

- (1) Wiring devices marked CO/ALR shall be permitted to directly terminate aluminum, copper, or copper-clad aluminum conductors in accordance with the branch-circuit conductor size (AWG) identified by the manufacturer's instructions.
- (2) For wiring devices not marked CO/ALR, the following shall apply:
 - a. They shall not be permitted to directly terminate aluminum conductors.
 - b. They shall be permitted to terminate directly to conductors other than aluminum in accordance with the branch-circuit conductor size (AWG) and type identified in the manufacturer's instruction.
- (3) Wiring devices installed using screwless terminals of conductor push-in type construction (also known as *push-in-terminals*) shall be installed on not greater than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only.

Informational Note: See UL 498-2017, *Attachment Plugs and Receptacles*, for information regarding screwless terminals of various type constructions employed on receptacles. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 498 as screwless terminals of conductor push-in type construction (also known as push-in terminals).

Additional Proposed Changes

File Name Description Approved

CN_11.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 11 appeared in the First Draft Report on First Revision No. 7872.

The Correlating Committee directs that CMP 18 review FR 7872 (created by CMP 9) to review for correlation with 406.10 (Wiring Device Terminations).

Related Item

First Revision No. 7872

Submitter Information Verification

Submitter Full Name: CC Notes		
Organization:	NEC Correlating Committee	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Fri Aug 02 22:11:01 EDT 2024	
Committee:	NEC-P18	

Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7881-NFPA 70-2024</u>	
Statement:	1214 & 263 These two comments add informational note No. 2 addressing UL 20 Snap Switches.	
	1389 - Text was modified to positive language to differentiate devices intended for copper conductor only and those that are intended for both copper and copper-clad aluminum conductors. It should be noted that copper conductors and copper-clad aluminum conductors are not equivalent. Due to the different ampacity rating, see Table 310.16.	
	718 – Informational note No. 2- i.e. UL 20 Snap Switches was added and provides needed coordination. See committee action on PC 1213 & amp; PC 304. Additionally, parentheticals removed from (3) and informational note to comply with Style Manual Section 3.5.1.1.	
	739 Text was modified by changing "wires" to "conductor" for clarity. The other changes do not improve the text and meaning of the requirements.	
	409 Parenthetical phrase was removed "(also known as push-in-terminals) in 406.10(3)" to comply with the Style Manual 3.5.1.1.	
	"Manufacturer's instructions" was retained to assure that	
	"Proper conductor size and type" are essential for safe use when terminated to a Wiring Device. Not providing clear and concise language to the reader can potentially create a hazardous condition simply due to not knowing the proper conductor size (AWG) and type (ex. Copper only and Copper Clad Aluminum and Aluminum).	

Correlating Committee Note No. 11-NFPA 70-2024 [Section No. 404.14(D)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 10:24:13 EDT 2024

Committee Statement

CommitteeThe Correlating Committee directs that CMP 18 review FR 7872 (created by CMPStatement:9) to review for correlation with 406.10 (Wiring Device Terminations).

First Revision No. 7872-NFPA 70-2024 [Section No. 404.14(D)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

e Puk	olic Comme	nt No. 739-NFPA 70-2024 [Section No. 406.10]	
406	6.10 Wiring De	vice Terminations.	
Wir	ing device term	inations shall comply with the following:	
(1)	Wiring devices or copper-clac (AWG) identif i	s marked CO/ALR shall be permitted to directly terminate aluminum, copper, I aluminum conductors- in accordance with the branch-circuit conductor size ed by the manufacturer's instructions .	
(2) For wiring <u>Wiring</u> devices not marked CO/ ALR, the following shall apply:They shall not b permitted to <u>ALR shall not directly terminate aluminum conductors.</u>			
(3) They shall be permitted to terminate directly to conductors other than aluminum in accordance with the branch-circuit conductor size (AWG) and type identified in the manufacturer's instruction.			
(4)	Wiring devices (also known a circuits and be	s installed using screwless terminals of conductor push-in type construction s <i>push-in-terminals</i>) shall be installed on not greater than 15-ampere branch e connected with 14 AWG solid copper wire <u>conductors</u> only.	
	Informationa information r receptacles. and insulatio terminals of	I Note: See UL 498-2017, <i>Attachment Plugs and Receptacles</i> , for egarding screwless terminals of various type constructions employed on Screwless terminals of separable-terminal assembly, spring-action clamp, n-displacement type constructions are not classified in UL 498 as screwless conductor push-in type construction (also known as push-in terminals).	
tatemer	nt of Probler	n and Substantiation for Public Comment	
this see	ction when 110	.3(B) already requries it. In fact, it is a violation of 4.1.1 of the NEC Style Manual	
	Related Ite	e <u>m</u>	
• FR 88	816		
ubmitte	er Informatio	n Verification	
Submi	tter Full Name	: Ryan Jackson	
Organi	ization:	Self-employed	
Street	Address:		
City:			
State:			
Zip:			
Submi Comm	ttal Date: ittee:	Sun Aug 04 13:58:53 EDT 2024 NEC-P18	
ommitte	ee Statemer	nt	
C		ad but and related SD	
Action	Action:		
Resolu	ution: <u>SR-78</u>	81-NFPA 70-2024	

Statement:	1214 & amp; 263 These two comments add informational note No. 2 addressing UL Snap Switches.	
	1389 - Text was modified to positive language to differentiate devices intended for copper conductor only and those that are intended for both copper and copper-clad aluminum conductors. It should be noted that copper conductors and copper-clad aluminum conductors are not equivalent. Due to the different ampacity rating, see Table 310.16.	
	718 – Informational note No. 2- i.e. UL 20 Snap Switches was added and provides needed coordination. See committee action on PC 1213 & amp; PC 304. Additionally, parentheticals removed from (3) and informational note to comply with Style Manual Section 3.5.1.1.	
	739 Text was modified by changing "wires" to "conductor" for clarity. The other changes do not improve the text and meaning of the requirements.	
	409 Parenthetical phrase was removed "(also known as push-in-terminals) in 406.10(3)" to comply with the Style Manual 3.5.1.1.	
	"Manufacturer's instructions" was retained to assure that	
	"Proper conductor size and type" are essential for safe use when terminated to a Wiring Device. Not providing clear and concise language to the reader can potentially create a hazardous condition simply due to not knowing the proper conductor size (AWG) and type (ex. Copper only and Copper Clad Aluminum and Aluminum).	

Public Comment No. 294-NFPA 70-2024 [Sections 406.12(D)(2), 406.12(D)(3)]

Sections 406.12(D)(2), 406.12(D)(3)

(2) Non-Grounding-Type Receptacles.

Where attachment to equipment grounding conductors does not exist in receptacle enclosures, the installation shall comply with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)(2)(c).

(a) Non-grounding-type receptacles shall be permitted to be replaced with other nongrounding-type receptacles.

(b) Non-grounding-type receptacles shall be permitted to be replaced with ground-fault circuit interrupter-type receptacles. These receptacles or their cover plates shall be marked "No Equipment Ground." Equipment grounding conductors <u>Conductors</u> shall not be connected from the <u>grounding terminals of the ground-fault circuit-interrupter-type receptacles to any outlets</u> supplied from the ground-fault circuit-interrupter receptacles.

(c) Non-grounding-type receptacles shall be permitted to be replaced with grounding-type receptacles where supplied through ground-fault circuit interrupters. Where grounding-type receptacles are supplied through ground-fault circuit interrupters, grounding-type receptacles or their cover plates shall be marked "GFCI Protected" and "No Equipment Ground," visible after installation. Equipment grounding conductors- Conductors shall not be connected between the grounding terminals of the grounding-type receptacles.

Informational Note No. 1: Some equipment or appliance manufacturers require that the branch circuit to the equipment or appliance includes an equipment grounding conductor.

Informational Note No. 2: See 250.114 for a list of cord- and plug-connected equipment or appliances that require equipment grounding conductors.

(3) Ground-Fault Circuit-Interrupter Protection.

Ground-fault circuit-interrupter protection for receptacles shall be provided where replacements are made at receptacle outlets that are required to be so protected elsewhere in this code.

Exception: The receptacle shall be permitted to be replaced with a new receptacle of the existing type, where GFCI protection is provided and the receptacle is marked "GFCI Protected" and "No Equipment Ground," in accordance with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)(2)(c), as applicable, where all of the following conditions exist:

- (1) The outlet box size will not permit the installation of the GFCI receptacle.
- (2) No electrically upstream outlet box will permit the installation of a GFCI receptacle.
- (3) A GFCI circuit breaker cannot provide the required GFCI protection.

Statement of Problem and Substantiation for Public Comment

This Public Comment is related to revisions proposed in Public Input No. 1804.

This Public Comment is needed to clarify the intent of the rules, and to stop the incorrect usage of the clearly defined NEC term "equipment grounding conductor".

I have worked in hundreds of older homes and apartments where the original branch circuit wiring did NOT include an equipment grounding conductor, such as knob and tube wiring and 2-wire NM cables. In fact, I also lived one home built in the late 1800's that was originally wired with knob and tube wiring, and another home built in the 1950's that was wired with 2-wire NM cable. Over the years, including during the 1950's and 1960's when major revisions were happening to branch circuit grounding

requirements and wiring method requirements, various installers had extended the existing branch circuit wiring using newer wiring methods such as NM cables containing one conductor with black insulation, one conductor with white insulation, and one bare wire that would normally be used as an equipment grounding conductor for circuits installed today. However, these older existing circuits provided no equipment grounding conductor, nor was it always required, and as such, the bare wire in these newer NM cable extensions of the branch circuit is essentially just a "spare" conductor. Ungrounded receptacles were installed throughout these homes, including on the portions of the branch circuits where the newer NM cables were extended. No language in the Code prohibits extending older existing circuits using newer wiring methods.

When replacing existing ungrounded receptacles on these existing branch circuits installers are permitted to install grounding-type receptacles as specified in 406.4(D)(2) [406.12(D)(2) for 2026]. Revisions are needed to clarify for example, that the "spare" conductor in the NM cable should NOT be connected to the grounding terminals of any replacement grounding-type receptacles. The bare wire (or green wire) in this case is NOT an equipment grounding conductor as defined in Article 100 and as such should not be called an equipment grounding conductor. In fact, the present wording in 406.12(D) (2)(b) and (c) incorrectly uses the term "equipment grounding conductor(s)" which makes no sense. If this bare wire in the newer NM cable truly was an equipment grounding conductor, it should absolutely be connected to the grounding terminals and accidentally came in contact with the ungrounded conductor on the line side of the GFCI receptacle! I believe the intent of this requirement is to prevent this exact situation, but the present terminology is incorrect and must be clarified. The present use of the term "equipment grounding to clarify these requirements.

Please see PDF showing replacement receptacles installed on EXISTING branch circuit wiring.

Related Item

• PI 1804

Submitter Information Verification

Submitter Full Name: Russ Leblanc		
Organization:	LeBlanc Consulting Services	
Street Address:		
City:		
State:		
Zip:		
Submittal Date:	Sun Jul 28 08:23:52 EDT 2024	
Committee:	NEC-P18	

Rejected but see related SR
<u>SR-7892-NFPA 70-2024</u>
The exception was modified by removing "where GFCI protection is provided, and the receptacle is marked "GFCI Protected" and "No Equipment
Ground," in accordance with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)(2)(c), as applicable," provides little clarity. The suggested change improves the intent of the requirement. The cross references are removed to state the requirements in positive language rather than sending the reader to other sections of the code it explains the conditions here.
The text was modified to replace "conductors" with "terminal" to clarify that an equipment grounding conductor is not available and should not be extended as such.

The intent is to exhaust all protection options prior to applying the exception.

Public Comment No. 1390-NFPA 70-2024 [Section No. 406.12(D)(3)]

(3) Ground-Fault Circuit-Interrupter Protection.

Ground-fault circuit-interrupter protection for receptacles shall be provided where replacements are made at receptacle outlets that are required to be so protected elsewhere in this code.

<u>Exception:</u> <u>The receptacle</u> <u>The receptacle</u> shall be permitted to be replaced with a new receptacle of the existing type , where <u>when it is not possible to provide</u> GFCI protection is provided and the receptacle is marked "GFCI Protected" and "No Equipment Ground," in accordance with 406.12(D)(2)(a) , 406.12(D)(2)(b) , or 406.12(D)(2)(c) , as applicable, where due to the existance of all of the following conditions- exist :

(1) The outlet box size will not permit the installation of the GFCI receptacle.

(2) No electrically upstream outlet box will permit the installation of a GFCI receptacle.

(3) A GFCI circuit breaker cannot provide the required GFCI protection.

Statement of Problem and Substantiation for Public Comment

The middle part of the first revision:

"where GFCI protection is provided and the receptacle is marked "GFCI Protected" and "No Equipment Ground," in accordance with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)(2)(c), as applicable,"

makes no sense. This exception applies when it is impossible to provide GFCI protection, so saying that that "GFCI protection is provided" seems wrong. If there is a case that is missed by deleting this phrase, I would suggest the panel consider adding an exception to 406.12(D)(2) instead, but I believe 406.12(D)(2) provided sufficient remedy for situations where a GFCI will not fit already.

Related Item

• FR 8817

Submitter Information Verification

Submitter Full Name: Jason PotterfOrganization:CiscoAffiliation:ESTAStreet Address:City:State:State:Zip:Ved Aug 21 19:53:58 EDT 2024Committee:NEC-P18

Committee Statement

Committee
Action:Rejected but see related SRResolution:SR-7892-NFPA 70-2024Statement:The exception was modified by removing "where GFCI protection is provided, and the
receptacle is marked "GFCI Protected" and "No Equipment

Ground," in accordance with 406.12(D)(2)(a), 406.12(D)(2)(b), or 406.12(D)(2)(c), as applicable," provides little clarity. The suggested change improves the intent of the requirement. The cross references are removed to state the requirements in positive language rather than sending the reader to other sections of the code it explains the conditions here.

The text was modified to replace "conductors" with "terminal" to clarify that an equipment grounding conductor is not available and should not be extended as such.

The intent is to exhaust all protection options prior to applying the exception.

₩	Public Comment No.	411-NFPA 70-20	024 [Section No. 406.16]	
NFPA	Γ.			

406.16 Receptacle Faceplates (Cover Plates).

Receptacle faceplates shall be installed to completely cover openings and seat against mounting surfaces.

Receptacle faceplates mounted inside boxes having recess-mounted receptacles shall effectively close openings and seat against mounting surfaces.

(A) Thickness of Metal Faceplates.

Metal faceplates shall be of ferrous metal not less than 0.76 mm (0.030 in.) in thickness or of nonferrous metal not less than 1.02 mm (0.040 in.) in thickness.

(B) Grounding.

Metal faceplates shall be grounded.

(C) Faceplates of Insulating Material.

Faceplates of insulating material shall comply with the following:

- (1) They shall be noncombustible.
- (2) They shall not be less than 2.54 mm (0.10 in.) in thickness unless formed or reinforced to provide adequate mechanical strength.
- (D) Receptacle Faceplates (Cover Plates) with Integral Night Lights, USB Chargers, or Both.

Flush device faceplates (cover plates) that integrally incorporate night lights, Class 2 output connectors (USB chargers), or both shall comply with all of the following:

- (1) Faceplate (cover plate) assemblies shall be listed.
- (2) During normal operation, night light and Class 2 supply connections shall not introduce current to the grounding means or to the equipment grounding conductor.
- (3) Night lights and Class 2 connections (USB chargers), if relying on spring-tensioned contacts for electrical power, shall comply with the following:
 - a. They shall not be rated more than 1 watt.
 - b. They shall be connected to only unpainted or unenameled heads of receptacle terminal screws made only of copper alloy unless the faceplate (cover plate) is additionally listed and identified that the spring-tensioned contacts are suitable for connection to unpainted or unenameled heads of terminal screws made of plated steel.

Additional Proposed Changes

File NameDescriptionApprovedCN_53.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 53 appeared in the First Draft Report on First Revision No. 8819.

The Correlating Committee directs that CMP 18 review FR 8819 and reconsider the use of several parenthetical phrases in the title of 406.16, and in 406.16(D)(1),406.3(3), 406.(3)(a) as parenthetical

expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1.

Related Item

• First Revision No. 8819

Submitter Information Verification

Submitter Full Name: CC NotesOrganization:NEC Correlating CommitteeStreet Address:City:City:State:State:Zip:Submittal Date:Tue Jul 30 15:38:55 EDT 2024Committee:NEC-P18

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7899-NFPA 70-2024</u>
Statement:	The title and text were revised by removing parenthetical phrase to comply with Section 3.5.1.1 of the Style Manual.

Correlating Committee Note No. 53-NFPA 70-2024 [Section No. 406.16]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:06:38 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 8819 and reconsider the use of several parenthetical phrases in the title of 406.16, and in 406.16(D)(1), 406.3(3), 406.(3)(a) as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1.

First Revision No. 8819-NFPA 70-2024 [Section No. 406.6(D)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Comment No. 426-NFPA 70-2024 [Section No. 406.16 [Excluding any NFPA Sub-Sections]]

Receptacle faceplates shall be installed to completely cover openings and seat against mounting surfaces.

Receptacle faceplates mounted inside boxes having recess-mounted receptacles shall effectively close openings and seat against mounting surfaces.

STANDARD PLASTIC COVER PLATES should not be used anymore. They break too easily exposing live parts. Putting people in harms way.

Statement of Problem and Substantiation for Public Comment

NYLON FACEPLATES are safer, unbreakable, and create a better reveal.

- Related Item
- Coverplate
 Faceplate

Submitter Information Verification

Submitter Full Name: William Riley Jr			
Organization:	Riley Electrical Works LLC		
Affiliation:	IBEW Union Hall 236		
Street Address:			
City:			
State:			
Zip:			
Submittal Date:	Tue Jul 30 16:22:03 EDT 2024		
Committee:	NEC-P18		

Committee Action:	Rejected
Resolution:	No technical substantiation provided other than an opinion that they easily break. It is suggested that the submitter seek a revision to improve the construction of a standard plastic cover plate through the product standard development process.
Public Comment No. 412-NFPA 70-2024 [Section No. 406.18]

406.18 Attachment Plugs, Cord Connectors, and Flanged Surface Devices.

All attachment plugs, cord connectors, and flanged surface devices (inlets and outlets) shall be marked with the manufacturer's name or identification and voltage and ampere ratings.

(A) Construction of Attachment Plugs and Cord Connectors.

Attachment plugs and cord connectors shall be constructed so that there are no exposed current-carrying parts except the prongs, blades, or pins. The cover for wire terminations shall be a part that is essential for the operation of attachment plugs or connectors (dead-front construction).

(B) Connection of Attachment Plugs.

Attachment plugs shall be installed so that their prongs, blades, or pins are not energized unless inserted into energized receptacles or cord connectors. No receptacle shall be installed so as to require the insertion of an energized attachment plug as its source of supply.

(C) Attachment Plug Ejector Mechanisms.

Attachment plug ejector mechanisms shall not adversely affect engagement of the blades of attachment plugs with the contacts of receptacles.

(D) Flanged Surface Inlet.

Flanged surface inlets shall be installed such that the prongs, blades, or pins are not energized unless energized cord connectors are inserted into them.

Additional Proposed Changes

File Name Description Approved

CN_54.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 54 appeared in the First Draft Report on First Revision No. 7940.

The Correlating Committee directs that CMP 18 review FR 7940 and reconsider the use of several parenthetical phrases in 406.18 (inlets and outlets), and 406.18(A)(dead front construction) as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1.

Related Item

• First Revision No. 7940

Submitter Information Verification

Submitter Full Name	: CC Notes
Organization:	NEC Correlating Committee
Street Address:	
City:	
State:	
Zip:	

Submittal Date Committee:	Tue Jul 30 15:40:19 EDT 2024 NEC-P18	
Committee Stat	tement	
Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7900-NFPA 70-2024</u>	
Statement:	Parenthetical removed parenthetical phrase to comply with Section 3.5.1.1 of the Style Manual. Dead front construction is a form of a plug construction and it is not necessary to call it out separately.	

Correlating Committee Note No. 54-NFPA 70-2024 [Section No. 406.18]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:08:07 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 7940 and reconsider the use of several parenthetical phrases in 406.18 (inlets and outlets), and 406.18(A)(dead front construction) as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1.

First Revision No. 7940-NFPA 70-2024 [Section No. 406.7]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Comment No. 1122-NFPA 70-2024 [Section No. 406.30(B)]

(B) Grounded Conductors.

Switches or circuit breakers shall Switches shall not disconnect the grounded conductors of circuits.

Exception: A switch or circuit breaker shall switch shall be permitted to disconnect a grounded circuit conductor where all circuit conductors are disconnected simultaneously, or where the device is arranged so that the grounded conductor cannot be disconnected until all the ungrounded conductors of the circuit have been disconnected.

Statement of Problem and Substantiation for Public Comment

On behalf of the Correlating Committee, a Task Group consisting of Panel Members from both Panels 10 and 18 (Chuck Kurten, Frank Tse, Rob Roettgers, Doug Smith, Bob Fahey and Nathan Philips) were asked to ensure the reorganized Article 404 for Switches and Article 406 for Wiring Devices are correlated.

"Circuit breakers" appearing in Article 406.30 (B) and in the Exception, was removed. Circuit breakers are covered by Article 404.

Related Item

• CC note 10

Submitter Information Verification

Submitter Full Name:	Charles Kurten
Organization:	UL Solutions
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu Aug 15 13:34:43 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7903-NFPA 70-2024</u>
Statement:	"Circuit breakers" appearing in Article 406.30 (B) and in the Exception, was removed. Circuit breakers are covered by Article 404.



(C) Switches Controlling Lighting Loads.

The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit serving bathrooms, hallways, stairways, and habitable rooms or occupiable spaces as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations under any of the following conditions:

- (1) Where conductors enter the box enclosing the switch through a raceway if the raceway is large enough for all contained conductors, including a grounded conductor
- (2) Where snap switches with integral enclosures comply with 300.17(E)
- (3) Where lighting in the area is controlled by automatic means <u>not a part of the switch</u> <u>which</u> <u>controls lighting loads that are supplied by a grounded general-purpose branch</u> <u>circuit</u> _
- (4) Where a switch controls a receptacle load

The grounded conductor shall be extended to any switch location as necessary, be connected to switching devices that require line-to-neutral voltage to operate the electronics of the switch in the standby mode, and meet the requirements of 406.50.

Exception: The connection requirement shall not apply to replacement or retrofit switches installed in locations prior to local adoption of 406.30(C) and where the grounded conductor cannot be extended without removing finish materials. The number of electronic control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25. For the purpose of this exception, a neutral busbar, in compliance with 200.4(B) and to which a main or system bonding jumper is connected, shall not be limited as to the number of electronic lighting control switches connected.

Informational Note: The provision for a grounded conductor is to complete a circuit path for electronic lighting control devices.

Statement of Problem and Substantiation for Public Comment

This suggested change addresses a gap in existing language that is written in a generic manner and that could be interpreted to circumvent the requirements of this section. The existing language found in 406.30(C)(3) states "Where lighting in the area is controlled by automatic means." This language could apply to the wall switch location in a room or a central lighting control system. the former would circumvent the requirement of this section. the suggested language addresses the gap that exists by offering specifics to exclude those controls that are a part of the switch.

Related Item

• PI 2157

Submitter Information Verification

Submitter Full Name:Thomas DomitrovichOrganization:Eaton Corporation

Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Mon Aug 05 20:30:19 EDT 2024
Committee:	NEC-P18
Committee Stateme	nt

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7904-NFPA 70-2024</u>
Statement:	The lighting area was changed for clarity as to what is meant by automatic means. The redundant text "to be installed" does not conform to sections 3.1.1, 3.1.2, and 3.5.1.1 of the NEC Style Manual and was removed

Public Comment No. 1123-NFPA 70-2024 [Section No. 406.36]

406.36 Indicating.

General-use and motor circuit <u>snap</u> switches where mounted in enclosures as described in 406.32 shall indicate, in locations that are visible when accessing the external operation means, whether they are in the open (off) or closed (on) position.

Exception: Vertically operated double-throw switches shall be permitted to be in the closed (on) position with the handle in either the up or down position.

Statement of Problem and Substantiation for Public Comment

On behalf of the Correlating Committee, a Task Group consisting of Panel Members from both Panels 10 and 18 (Chuck Kurten, Frank Tse, Rob Roettgers, Doug Smith, Bob Fahey and Nathan Philips) were asked to ensure the reorganized Article 404 for Switches and Article 406 for Wiring Devices are correlated.

Article 406.36 was revised by removing "and motor circuit". Motor circuit switches are covered by Article 404. Additionally, "snap" was added to general use snap switch for clarity.

Related Item

• CC note 10

Submitter Information Verification

Submitter Full Name: Charles KurtenOrganization:UL SolutionsStreet Address:City:State:State:Zip:Thu Aug 15 13:43:24 EDT 2024Committee:NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7905-NFPA 70-2024</u>
Statement:	Article 406.36 was revised by removing "and motor circuit". Motor circuit switches are covered by Article 404. Additionally, "snap" was added to general use snap switch for clarity.

Public Comment No. 1124-NFPA 70-2024 [Section No. 406.38(A)]

(A) Location.

All switches and circuit breakers used as switches shall switches shall comply with the following:

- (1) They shall be located so that they can be operated from readily accessible places.
- (2) They shall be installed such that the center of the grip of the operating handle of the switch or circuit breaker the operating handle or actuating means of the switch, when in its highest position, is not more than 2.0 m (6 ft 7 in.) above the floor, finished grade, or working platform, except as follows:
- (3) On busway installations, fused switches and circuit breakers shall be permitted to be located at the same level as the busway if suitable means is provided to operate the handle of the device from the floor.

Switches and circuit breakers installed <u>.</u> Switches installed <u>adjacent to motors, appliances,</u> <u>or other equipment that they supply shall be permitted to be located higher than 2.0 m (6 ft 7 in.) and to be accessible by portable means.</u>

(4) Hookstick operable isolating switches shall be permitted at greater heights.

Statement of Problem and Substantiation for Public Comment

On behalf of the Correlating Committee, a Task Group consisting of Panel Members from both Panels 10 and 18 (Chuck Kurten, Frank Tse, Rob Roettgers, Doug Smith, Bob Fahey and Nathan Philips) were asked to ensure the reorganized Article 404 for Switches and Article 406 for Wiring Devices are correlated.

Article 406.38 was revised by removing "and circuit breakers used as switches" since circuit breakers are covered by Article 404.

No. (2) was modified by removal of "center of grip of the"; "or actuating means" was added; "or circuit breaker' was removed.

a) was removed c) was removed, and b) was modified to remove "and circuit breakers" and relocated to remove references for devices covered by Article 404 and improved sentence structure. "Finished grade" was also added from existing Article 404 text

Related Item

CC note 10

Submitter Information Verification

Submitter Full Name:	Charles Kurten
Organization:	UL Solutions
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Thu Aug 15 13:50:25 EDT 2024
Committee:	NEC-P18

Committee Sta	atement
Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7906-NFPA 70-2024</u>
Statement:	Article 406.38 including 406.38(A) was revised by removing "and circuit breakers used as switches" since circuit breakers are covered by Article 404.
	No. (2) was modified by removal of "center of grip of the"; and replaced with "actuating means" for clarity of a snap switch actuator; "or circuit breaker" was removed, since circuit breakers are covered by Article 404."Finished grade" was also added from existing Article 404 text.
	a) and c) were removed since these are not relevant to a snap switch use;
	and
	b) was modified to remove "and circuit breakers" and relocated to an exception to (2) as it is the only remaining exception from the previous list of text.

Public Comment No. 1776-NFPA 70-2024 [Section No. 406.40(D)]

(D) Faceplates (Cover Plates) Incorporating Night Lights, USB Chargers, or Both.

For snap switches, dimmers, and control switches, faceplates (cover plates) that integrally incorporate night lights Class 2 connections (USB chargers), or both shall comply with all the following:

- (1) Faceplate (cover plate) assemblies shall be listed.
- (2) During normal operation, night lights and Class 2 connections (USB chargers) shall not introduce current to the bonding means or the equipment grounding conductors.
- (3) Electrical power supply connections to night lights and Class 2 connections (USB chargers) shall not be connected across the line and load terminals of snap switches, dimmers, and control switches having a marked OFF position.
- (4) Night lights and Class 2 connections (USB chargers), if relying on spring-tensioned contacts for electrical power, shall comply with the following: They shall not be rated shall not be rated for more than 1 watt.
- (5) They shall be connected to only unpainted or unenameled heads of switch terminal screws made of only copper alloy unless the faceplate (cover plate) is additionally listed and identified that the spring-tensioned contacts are suitable for connection to unpainted or unenameled heads of terminal screws made of steel.

Additional Proposed Changes

File NameDescription.1724877251996SnapPower Photo

<u>Approved</u>

Statement of Problem and Substantiation for Public Comment

Currently, many hardwired light switches on the market incorporate nightlights, and when these switches are turned to the 'off' position, they still carry current to the light bulb—even more current than what spring-tensioned products deliver. However, these are permitted because the light switch has no labeled "off" position. This raises an important question: Why does the code allow a hardwired product that delivers current to the bulb when it is in the 'off' position, just because the switch doesn't explicitly say 'off'? What about other alternatives (see photo)?

It is commonly believed by most consumers that when a light switch is in the 'off' position and the overhead light is off, there is no power going to the bulb. So, if consumers generally believe that the power is off even though the switch doesn't explicitly indicate it, then there's no practical difference. Additionally, customers are instructed to turn off the power at the breaker before working on an electrical circuits. If they follow these instructions, there should be no risk of shock. Lastly, the current carried by spring tensioned contacts in this state is extremely limited, making the risk of serious electrical shock non-existent.

The SnapPower product shown in the photo features a switch on the front face that, when turned to the 'off' position, completely eliminates the current flow through the spring-tensioned product. This added safety feature makes the spring-tensioned contacts safer than existing hard wired products with nightlights because it provides the option to turn off the current being delivered to the overhead light.

SnapPower has conducted testing demonstrating that steel, painted, and enameled screws are not a problem, especially with the 1 watt power limit. Safety requirements in UL 514D (faceplate connection methods) have been developed for steel screws in response to a concern in the Committee Statement

last cycle.

We agree with the submitter of Public Input 3095 that the listing of the faceplate shall address any restrictions on the connections (consistent with our Public Comment No. 1665-NFPA 70-2021).

Related Item

• PI 3095 • FR 7852

Submitter Information Verification

Submitter Full Name:	William Koffel
Organization:	Koffel Associates, Inc.
Affiliation:	SnapPower
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Aug 27 10:32:30 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected
Resolution:	The rationale to remove number 3 is not accurate. Switches marked "Off" are required by the UL 20 Standard, para. 7.6.15 to completely disconnect all ungrounded conductors in the circuit when in the marked "Off" position" and NEC 404.20(B). If this cover plate is used with a switch marked "Off", it will expose the user to an electric shock hazard since the cover plate enables current flow to the lighting fixture or other utilization equipment. It should also be noted that a general use snap-switch can serve as the disconnect. Nos. 4 and 5 to remain as no data was provided to support this revision. Additionally, UL 514D the Standard for these devices, requires a marking/instruction warning not to install the cover plate on receptacles with steel wire-binding screws. See UL 514D, para. E.6.5 e). Annex E in UL 514D does not cover all switches.

Public Comment No. 1213-NFPA 70-2024 [Section No. 406.46(C)] (C) Snap Switch Terminations:
Snap switch terminations shall comply with the following:
(1) Conner, eluminum, and conner alad eluminum conductors shall be permitted to ter

- (1) Copper, aluminum, and copper-clad aluminum conductors shall be permitted to terminate at the terminals of snap switches marked CO/ALR.
- (2) Only copper and copper-clad aluminum conductors shall be permitted to be terminated at the terminals of 15-ampere and 20-ampere snap switches not marked CO/ALR.
- (3) Snap switches connected using screwless terminals of conductor push-in type construction (also known as conductor push-in terminals) shall be installed on not greater than 15ampere branch circuits and be connected with 14 AWG solid copper wire only unless listed and marked for other types of conductors.

Informational Note: See UL 20-2018, General-Use Snap Switches, for information regarding screwless terminals of various voltage type constructions employed on snap switches. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 20 as screwless terminals of conductor push-in type construction (also known as conductor push-in terminals).

Statement of Problem and Substantiation for Public Comment

This subsection is no longer necessary as result of relocating general use snap switches into section 406 under the new title of "Wiring Devices". Subsection 406.10, in Part 1. General, applies generally to all wiring devices which renders 406.46(C) unnecessary. The current requirements in 406.10 is aligned with the UL 20 standards updates currently in process, which is identical to UL498 requirements.

There is a companion public comment to add Informational Note regarding UL 20 to subsection 406.10.

The two proposals will resolve the correlation concern expressed by the Correlating Committee

Related Public Comments for This Document

<u>Relationship</u>

Related Comment Public Comment No. 1214-NFPA 70-2024 [Section No. 406.10] Public Comment No. 1214-NFPA 70-2024 [Section No. 406.10] Related Item

• FR7872

Submitter Information Verification

Submitter Full Name: Megan Hayes Organization: NEMA Street Address: City: State:
 Zip:
 Submittal Date:
 Sat Aug 17 02:04:17 EDT 2024

 Committee:
 NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7920-NFPA 70-2024</u>
Statement:	This subsection is no longer necessary as result of relocating general use snap switches into section 406 under the new title of "Wiring Devices". Subsection 406.10, in Part 1. General, applies generally to all wiring devices which renders 406.46(C) unnecessary. The current requirements in 406.10 is aligned with the UL 20 standards updates currently in process, which is identical to UL498 requirements. There is a companion public comment to add Informational Note regarding UL 20 to subsection 406.10. The two proposals will resolve the correlation concern expressed by the Correlating Committee.

Public Comment No. 304-NFPA 70-2024 [Section No. 406.46(C)]

(C) Snap Switch Terminations.

Snap switch terminations shall comply with the following:Copper, aluminum, and copper

Ξ

clad aluminum conductors shall be permitted to terminate at the terminals of snap switches marked CO/ALR.

• Only copper and copper-clad aluminum conductors shall be permitted to be terminated at the terminals of 15-ampere and 20-ampere snap switches not marked CO/ALR.

• Snap switches connected using screwless terminals of conductor push-in type construction (also known as conductor push-in terminals) shall be installed on not greater than 15-ampere branch circuits and be connected with 14 AWG solid copper wire only unless listed and marked for other types of conductors.

Informational Note: See UL 20-2018, General-Use Snap Switches, for information regarding screwless terminals of various voltage type constructions employed on snap switches. Screwless terminals of separable-terminal assembly, spring-action clamp, and insulation-displacement type constructions are not classified in UL 20 as screwless terminals of conductor push-in type construction (also known as conductor push-in terminals).

Statement of Problem and Substantiation for Public Comment

Section 406.46(C) is no longer necessary as result of relocation of general-use snap switches into Article 406 under the new title of "Wiring Devices". Section 406.10 is located in Part I (GENERAL), so it applies to all wiring devices including general-use snap

switches.

The current requirements in 406.10 are also aligned with the applicable product standards (UL 20 and UL498).

There is also a companion public comment which relocates the Informational Note in 406.46(C) to 406.10.

These comments resolve the correlation concern expressed by the Correlating Committee (CC Note 11)

Related Item

CC note 11

Submitter Information Verification

Submitter Full Name: Charles Kurten	
Organization:	UL Solutions
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Mon Jul 29 10:08:48 EDT 2024
Committee:	NEC-P18

Committee Statement		
Committee Action:	Rejected but see related SR	
Resolution:	<u>SR-7920-NFPA 70-2024</u>	
Statement:	This subsection is no longer necessary as result of relocating general use snap switches into section 406 under the new title of "Wiring Devices". Subsection 406.10, in Part 1. General, applies generally to all wiring devices which renders 406.46(C) unnecessary. The current requirements in 406.10 is aligned with the UL 20 standards updates currently in process, which is identical to UL498 requirements.	
	There is a companion public comment to add Informational Note regarding UL 20 to subsection 406.10.	
	The two proposals will resolve the correlation concern expressed by the Correlating Committee.	

Public Com	ment No. 698-NFPA 70-2024 [Section No. 410.2]
410.2 Listing	Requirements.
All luminaires,	lampholders, and retrofit kits shall be listed.
Additional Propos	sed Changes
File Name CN_63.pdf	Description Approved
Statement of Prot	olem and Substantiation for Public Comment
NOTE: The follow	ing CC Note No. 63 appeared in the First Draft Report on First Revision No. 7986
The Correlating C Requirements" in application of "hor	ommittee directs that CMP 18 review FR 7986 and confirm if the "Listing 410.2 are sufficiently broad to include the specific ticultural lighting equipment".
First Revision No	Related Item p. 7986
Submitter Informa	ation Verification
Submitter Full Na	ame: CC Notes
Organization: Street Address: City: State: Zip:	NEC Correlating Committee
Submittal Date: Committee:	Fri Aug 02 12:27:27 EDT 2024 NEC-P18
Committee Staten	nent
Committee Action:	Rejected but see related SR
Resolution: Statement:	<u>SR-7968-NFPA 70-2024</u> Added text to clarify that listing is required for equipment addressed by Article 410.

L

Correlating Committee Note No. 63-NFPA 70-2024 [Section No. 410.172]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:23:13 EDT 2024

Committee Statement

CommitteeThe Correlating Committee directs that CMP 18 review FR 7986 and confirm if theStatement:"Listing Requirements" in 410.2 are sufficiently broad to include the specific
application of "horticultural lighting equipment".

First Revision No. 7986-NFPA 70-2024 [Section No. 410.172]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Co	omment No. 1450-NFPA 70-2024 [Section No. 410.3]
410.3 Rec	onditioned Equipment.
Reconditior be installed instructions	ned luminaires, lampholders, ballasts, LED drivers, lamps, and retrofit kits shall not <u>permitted</u> . If a retrofit kit is installed in a luminaire in accordance with the installation s, the retrofitted luminaire shall not be considered reconditioned.
Statement of P	roblem and Substantiation for Public Comment
reconditioning in place and sh	to include the fact that the equipment covered by this article should not be reconditioned nall not be installed.
<u>Relat</u> • fr 7972	ed Item
Submitter Infor	mation Verification
Submitter Full	I Name: Thomas Domitrovich
Organization:	Eaton Corporation
Street Addres	s:
City:	
State:	
ZIP: Submittal Dat	e. Fri Aug 23 08:56:10 EDT 2024
Committee:	NEC-P18
Committee Sta	tement
Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7981-NFPA 70-2024</u>
Statement:	The NEC does not cover the ability to prohibit "reconditioned" equipment . However, what the NEC can address is the ability to install a reconditioned equipment. Changed to a list format to comply with the NEC Style Manual.

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Public Co	omment No. 417-NFPA 70-2024 [Section No. 410.3]
410.3 Re	conditioned Equipment.
Recondition be installe instruction	oned luminaires, lampholders, ballasts, LED drivers, lamps, and retrofit kits shall not d. If a retrofit kit is installed in a luminaire in accordance with the installation is, the retrofitted luminaire shall not be considered reconditioned.
Additional Pro	posed Changes
<u>File Name</u> CN_58.pdf	Description Approved
Statement of F	Problem and Substantiation for Public Comment
NOTE: The fo	llowing CC Note No. 58 appeared in the First Draft Report on First Revision No. 7970.
The Correlatir with recomme is "The installa identified shou	ng Committee directs that CMP 18 review FR 7970 and consider revising the text to align anded wording regarding reconditioning. The recommended wording for the first sentence ation of the following reconditioned equipment shall not be permitted." The items ald be put into a list format in accordance with Section 2.2.1 of the NEC Style Manual.
	Related Item
 First Revisio 	n No. 7970
Submitter Info	rmation Verification
Submitter Fu	II Name: CC Notes
Organization	NEC Correlating Committee
Street Addres	SS:
City:	
State:	
Submittal Dat	te: Tue Jul 30 15:52:56 EDT 2024
Committee:	NEC-P18
Committee Sta	atement
Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7981-NFPA 70-2024</u>
Statement:	The NEC does not cover the ability to prohibit "reconditioned" equipment . However, what the NEC can address is the ability to install a reconditioned equipment. Changed to a list format to comply with the NEC Style Manual.

L

Correlating Committee Note No. 58-NFPA 70-2024 [Section No. 410.3]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:15:43 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 7970 and consider revising the text to align with recommended wording regarding reconditioning. The recommended wording for the first sentence is "The installation of the following reconditioned equipment shall not be permitted." The items identified should be put into a list format in accordance with Section 2.2.1 of the NEC Style Manual.

First Revision No. 7970-NFPA 70-2024 [Section No. 410.2]

Ballot Results

- This item has passed ballot
 - 12 Eligible Voters
 - 1 Not Returned
 - 11 Affirmative All
 - 0 Affirmative with Comments
 - 0 Negative with Comments
 - 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Comment No. 1676-NFPA 70-2024 [New Section after 410.5]

TITLE OF NEW CONTENT

410.6 Luminaire Retrofits.

<u>A luminaire that is modified so that it can non longer accept the original lamp shall be relabeled</u> with a label provided with the listed retrofit kit and affixed to the luminaire. The label shall comply with all of the following:

<u>a. Be field applied with the listed retrofit kit and affixed to the luminaire. The label shall be applied to the luminaire where visible during relamping.</u>

b. Indicate that the luminaire has been modified and can no longer operate the originally intended lamps.

c. Identify the manufacturer's name and replacement lamp type/model to be used.

Statement of Problem and Substantiation for Public Comment

CMP14 accepted language in the first draft for 501.130, 502.130, and other hazloc articles to give clear instructions on luminaire retrofit kits. The problem is that most of the language accepted is generic retrofit language that belongs in Article 410, so public comments have been submitted to remove much of the text and simply the requirements for hazardous location. While much of the originally accepted first draft language is covered in the Product Standards and doesn't belong in the NEC®, it's important that a retrofitted luminaire is properly identified in the field to indicate when it can no longer accept the original lamp type so this proposal is submitted to put that language in Article 410 as it would apply to any luminaire retrofit, regardless of location.

Related Item

• FR-8336 • CCN-336

Submitter Information Verification

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Submittal Date:	Mon Aug 26 09:18:06 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected
Resolution:	The listing certification requirements for the retrofit kits already address these marking requirements.

Public Comment No. 1403-NFPA 70-2024 [Section No. 410.36(A)]

(A) Luminaires Supported By Outlet Boxes.

Luminaires shall be permitted to be supported by outlet boxes or fittings installed as required by 314.23. The installation shall comply with the following requirements:

- (1) The outlet boxes or fittings shall comply with 314.27(A)(1) and 314.27(A)(2).
- (2) Luminaires shall be permitted to be supported In habitable rooms, hallways, and foyers of one- and two-family dwellings, a listed weight-supporting ceiling receptacle (WSCR) and a compatible weight-supporting attachment fitting (WSAF) installed in accordance with 314.27(E) shall be installed in all ceiling outlet boxes for luminaires. Informational Note: See ANSI/NEMA WD-6, American National Standard for Wiring Devices - Dimensional Specifications, for standard configurations of WSCR and WSAF. Exception: A listed WSCR shall not be required in outlet boxes for any of the following: a. Electric-discharge or LED tube-type luminaires b. Track lighting c. Recessed luminaires d. Cove lighting
- (3) <u>Outlet boxes complying with 314.27(E) shall be considered lighting outlets as required by 210.70(A), (B), and (C).</u>

Additional Proposed Changes

File Name SKYX Final Report 20240828.pdf Description Supporting Material SKYX Final Report **Approved**

Statement of Problem and Substantiation for Public Comment

The only change in this PC is to modify (A)(2) including an exception and an informational note. The PC only addresses luminaire installation in new construction or a significant remodel; there are no retroactive requirements. Additionally, a letter of compliance was provided to NFPA to satisfy the ANSI/NFPA Essential Patent Requirements; if the mandatory use of the WSCR is approved in the NEC-2026, SKYX Platforms will agree to license the WSCR for no licensing fee.

Based on prior Panel feedback, a standard NEMA configuration was attained and proposed as an Informational Note. The WSCR for luminaires is keyed so that it will only accept the WSAF for luminaires.

Panel feedback included an assertion that mandating the WSCR would stifle innovation and limit the variety of products. However, it will increase the variety of products on the market due to the ease of installing and replacing a plug-and-play luminaire. As discussed in detail below, mandating the WSCR will increase safety. Based on panel concerns, it has been demonstrated that the WSCR can be used in either a low-profile or large-foot print luminaire. As provided in the exception, this requirement excludes recessed lighting.

The panel expressed concern that mandating the use of WSCRs could increase the number of times that ladders are used. Since the requirement is for new construction, it will be many years before the homeowner is likely to change the luminaire. If someone chooses to replace a luminaire, the time to install a luminaire when a WSCR/WSAF is used is significantly shorter and safer, as demonstrated by the study conducted by recognized experts in the field of falls and ladder safety.

NEW STUDY: LADDER USE DURING INSTALLATIONS. In response to the panel statement questioning if the WSCR luminaire installation is safer than the traditional installation, a study with a 3rd party was commissioned to review factors that contribute to the severity of hazards during luminaire installation. There were three installation types that were examined in this study: a)

traditional to traditional, b) convert traditional to WSCR/WSAF and c) replacing existing luminaire with a WSAF to a new luminaire with WSAF. All luminaires were assembled prior to installation. The study conducted by Dr. Erika M. Pliner, PhD and Kurt E. Beschorner, PhD is attached and the major conclusions follow.

The more time on the ladder, the more risk for a fall or injury. The study found the average installation time on the ladder is 20 minutes for a) traditional, less than 4 minutes to b) convert from traditional to WSCR/WSAF, and less than a half minute for c) replacing an existing WSAF luminaire.
 Time holding the luminaire during installation was examined. The study found a holding time of 1.33 minutes for a) traditional [when using a cross-bar to temporarily support the

luminaire], 0.76 minutes [43% reduction in time] for b) traditional to WSCR, and 0.22 minutes [83% reduction from traditional] for a c) replacement of a new luminaire with WSAF. For conditions b) and c), a temporary support for the luminaire is not necessary.

3. Time on the ladder that required the installer's shoulder(s) to be raised 90 degrees or more during the uninstallation and installation of a light fixture was examined. The average raised shoulder time for a) traditional installation to traditional installation is 13 minutes, 2.04 minutes for b) traditional to WSCR, and less than a minute for a c) replacement of a luminaire with WSAF

A reduced time on the ladder reduces the risk of a fall and injury. While on the ladder and performing multiple tasks, the risk of fall and injury is increased. If the WSCR is installed during construction, the installer never needs to touch the wires and be exposed to a shock hazard. With the WSCR, the inspector can easily confirm proper wiring through the use of a circuit tester, which could eliminate the need for an inspector to use a ladder.

Falls are a leading cause of injuries based on CDC data. Reducing fall hazards has been a major educational goal of OSHA for many years. Simplifying the task that needs to be performed on a ladder (which also reduces the time spent on a ladder) has been shown to greatly minimize the fall hazard. Multi-tasking while on a ladder contributes to the likelihood of falling. Clearly this applies to a traditional luminaire installation with many steps. Weight and off-set balance factors contribute to the fall hazard. The installer must not only balance himself but also the luminaire while on a ladder.

According to Pliner et al, a longer time to complete the task resulted in poorer performance in accomplishing the task and increased ladder fall risk exposure. This research involved older individuals, which reflects the aging population of the skilled electrical industry. In Pliner's 2020 doctoral dissertation study, it was clear that multi-tasking negatively affected task completion time.

Additionally, there are instances documented in the CPSC database of parts or entire fixtures (luminaires) falling, as well as the installers themselves falling.

NEW CONSTRUCTION INSTALLATION. The installer is wiring a 2.6-ounce WSCR into the ceiling versus the traditional wiring while supporting the weight and balancing the luminaire. On average, luminaires weigh from 3 to 15 pounds with an average diameter of 24 inches.

Why does the initial luminaire installation or future luminaire changes have to be hard-wired? Now technology exists to mitigate the hazards, and should become mandatory for safety. Safety in the NEC is a continuing evolution. When the screw shell lampholder design was standardized, why wasn't a weight supporting quick-connect option for luminaires also included? Simply put, because the technology didn't exist. When looking around the home, most electrical equipment is plug and play, except ceiling luminaires.

FUTURE LUMINAIRE INSTALLATION OR REPLACEMENT. With the WSCR already being installed in the ceiling, the luminaire is plug-and-play. This feature is convenient for the installer, as the luminaire can be installed at a later date.

In the past, televisions and many appliances were hardwired; imagine having to rewire whenever the appliance needs to be moved or replaced. Microwave ovens and toaster ovens likely wouldn't be as popular today if they were hardwired. These examples illustrate the importance of making the WSCR/WSAF mandatory. Hardwiring limits consumer flexibility to change decor and devices. When looking around the home, most electrical equipment is plug and play, except ceiling luminaires and ceiling fans.

DATA TO SUBSTANTIATE. A significant amount of information was collected and analyzed and was provided during the First Draft stage, including information from the U.S. Census Bureau, OSHA,

NIOSH, CPSC, and CDC.

The data included a death of a professional electrician while installing a luminaire (OSHA); CPSC data shows falls from ladders while installing lights and lighting fixtures falling on people. OSHA reports point to two professional electricians' deaths that potentially could've been prevented by the use of WSCR. See the following links: https://www.osha.gov/pls/imis/establishment.inspection_detail? id=18396960 https://www.osha.gov/pls/imis/establishment.inspection_detail?

NFPA Report No. USS117 published in February 2022, "Home Fires Caused by Electrical Distribution and Lighting Equipment" provides clear evidence that not enough emphasis is placed on incorrect installation of lighting. The reports noted that fires involving electrical distribution and lighting equipment caused an estimated average of 430 civilian deaths and 1,070 civilian injuries per year in 2015–2019, as well as an estimated \$1.3 billion in direct property damage each year. Specifically, wiring and related equipment accounted for 68% of these fires, 60% of the property damage and 42% of the civilian deaths and 53% of injuries. Arcing served as the heat source in 73% of these fires.

The CPSC estimates there are 4 electrocution deaths per year associated with lighting products (Hnatov, 2009) that they have been able to identify. One death is one too many. -- CPSC data from the National Electronic Injury Surveillance System (NEISS) database (CPSC, 2019) from 2009 to 2013 revealed 38 incidents resulting in hospital emergency room visits involving the installation of luminaires; 32 of those incidents involved falls and at least four of those incidents involved the victims being shocked.

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Pliner, Erika Mae. "Factors Contributing to Ladder Falls and Broader Impacts on Safety and Biomechanics." University of Pittsburgh, 2020.

Related Item

• PI 3287

Submitter Information Verification

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Committee:	NEC-P18
Committee St	atement
Committee Action:	Rejected
Resolution:	The product is not prohibited by the NEC and is also commercially available. Use of this product would require redesign of many luminaire types and limit form factor of future luminaire designs. Data demonstrates reduced ladder time when using the device but does not support a conclusion that the current installation practice for ceiling surface-mounted residential luminaires presents a safety concern that would be solved with mandating use of the WSCR. Additionally, data does not support the conclusion that DIY installers cannot safely install these products. Mandating the use of WSCRs could increase the number of times that ladders could be used in the short to medium term.

Consulting Report

Time Analysis of Ceiling Light Fixture Installation: Influence of Plug-in Solutions

Prepared by:

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Presented for: SKYX Platforms Corp.

August 28th 2024

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Team Expertise

Dr. Erika Pliner is an Assistant Professor in Mechanical Engineering at the University of Utah. She obtained her PhD in Bioengineering at the University of Pittsburgh with a specialization in whole-body biomechanics. In addition, she completed postdoctoral training in neuromechanics and physiology. She obtained her BS and MS in Mechanical Engineering at the University of Wisconsin-Milwaukee. Dr. Pliner's research applies core competencies on biomechanics, ergonomics and neuroscience to improve personal and occupational safety. She has designed and conducted multiple ladder safety research studies, identifying individual, environmental, and biomechanical risk factors of ladder falls in the occupational and domestic setting. She is the primary instructor of the Ergonomics and Occupational Biomechanics courses at the University of Utah.

Dr. Kurt Beschorner is an Associate Professor in Bioengineering at the University of Pittsburgh. He has specialized in fall prevention using methods of mechanics, understanding of humans and their motion, and ergonomics. He has led several projects to identify contributing factors of falling considering ladder design, individual risk factors, shoes, and flooring. He also is the Chief Executive Manager of Tread Traction Technologies, LLC where he works with companies to develop products that reduce falling risk. In this role, he has worked directly with footwear and walking surface companies to improve product design in ways that reduce fall risk. During this project, he operated in his role at Tread Traction Technologies, LLC and not through his position at the University of Pittsburgh.

Motivation

The installation of ceiling light fixtures subjects the worker or homeowner to risk of a ladder fall injury and musculoskeletal disorders.

The hazardous nature of ladder use is supported by injury records among occupational workers and emergency department visits. Annually, ladders are the primary source to over 136,000 injuries requiring emergency care (D'Souza, Smith and Trifiletti 2007). In addition, ladders are the leading cause of fatality among work-related falls from a height (Bureau of Labor Statistics 2016). Ladder use is a common task among homebuilders, contractors, and homeowners that should be carefully managed and therefore has been the subject of regulation. Minimizing worker fatigue and ladder use exposure can reduce injury risk by improving balance control and limiting the opportunity for a fall, respectively. For example, ladder fall injury records of workers revealed the time to ladder fall injury was further delayed (indicating lower risk) among works who had longer accumulative rest breaks (Arlinghaus, Lombardi et al. 2012),

which suggests the relevance of both fatigue and exposure to fall risk. Faster task completion times for ladder use tasks has been argued to reduce ladder fall risk in other peer-reviewed studies (Pliner, Sturnieks and Lord 2020, Pliner, Sturnieks et al. 2021). New consumer ladder-related products may achieve reduced fall risk if they enhance the efficiency of ladder work tasks and reduce the time spent on a ladder.

The installation of ceiling light fixtures requires overhead arm postures, upper limb effort to support the fixture, bimanual motor control. Overhead arm postures subject tissues in the upper extremities to additional strain during shoulder flexion and abduction (upper arm elevated above 90°). Individual strength is reduced in shoulder flexion and abduction (Stobbe 1982), leading to earlier fatigue (Chaffin 1973). Prolonged exertion, as can occur when holding a light fixture during installation, further exacerbate individual fatigue and pain (Caldwell and Smith 1966). The bimanual motor control during installation of a light fixture (e.g. wiring) hastens fatigue due to the increase in muscle activity that is required for precise actions (i.e. muscle co-contraction). The additive strenuous demands of ceiling light installation (i.e. overhead arm posture, fixture load, motor control) expose the worker or homeowner to a risk for musculoskeletal disorders. Repeated exposure of this type of task can lead to permanent functional disability (Johansson and Sojka 1991). New consumer products that reduce the time of these strenuous demands during ceiling fixture installation are expected to reduce the risk of musculoskeletal disorder.

Purpose

The objective of this project was to conduct a time analysis of ceiling light fixture installation between a traditional installation method and a novel installation method with new consumer products (Figure 1). The new consumer products comprised a weight support ceiling receptacle (WSCR) and weight-supporting attachment fitting (WSAF). The time analysis comprised four task-based measures, quantifying the 1) time on the ladder, 2) time the arm elevated above 90°, 3) time holding the fixture, and 4) the number of dropped items. Longer time durations in these task-based measures are associated with increased injury risk due to a fall from a ladder, user fatigue and musculoskeletal disorder. In particular, task-based measure 1 (time on the ladder) is directly related to fall risk and task-based measures 2 (time the arm elevated above 90°) and 3 (time holing fixture) are directly related to fall risk. Task-based measure 4 (number of dropped items) is a performance metric related to mistakes where more dropped items indicate poorer performance in completing the fixture-changing task.



Figure 1: Diagram fo parts for a standard (a) and a novel (b) ceiling light fixture installation.

Methods

Participants

Ten adults [8 men; 2 women; mean (standard deviation) height: 1.78 (0.01) m] were recruited to complete replacement of a ceiling light fixture (referred to hereafter as users). Users were novice to light fixture installation with do-it-yourself project experience.

Data Collection

All users completed three light fixture changing trials. Each trial comprised uninstallation and installation of a light fixture. Three uninstallation/installation conditions were presented in randomized order (order of presentation in Appendix A):

Traditional to Traditional – The standard method to uninstall and install a light fixture (Figure 1a).

Traditional to WSCR/WSAF – The standard method to uninstall a light fixture (Figure 1a), installation of the weight support ceiling receptacle (WSCR), and installation of the light fixture with the weight-supporting attachment fitting (WSAF) (Figure 1b).

WSAF to WSAF – Uninstallation and installation of a light fixture with a weight-supporting attachment fitting (WSAF) (Figure 1b).

The same chain light fixture was used in all conditions (Appendix B; Kichler Lighting LLC, Solon, OH). The diameter (18.5 inches) and weight (10.0 lbs.) of this light fixture fell within one standard deviation of the mean diameter and weight of commercially available light fixtures (Appendix C). Installation instructions were provided for the traditional and novel installation methods (Appendix D-F). To complete the light fixture changing tasks, users climbed a 6-foot fiberglass step ladder with a 250 lbs. load capacity (Werner Co., Itasca, IL). Placement of the ladder was fixed by the project coordinators. The ladder was placed in a location that minimized overreach during the uninstallation/installation task for the average user. Users were provided with non-powered tools to complete the task.

Users were asked to rest for 2-minutes between each uninstallation/installation phase and trial. The **Traditional to Traditional** and **WSAF to WSAF** conditions comprised two phases: uninstallation and installation. The **Traditional to WSCR/WSAF** condition comprised three phases: uninstallation, installation of WSCR, and installation.

Video recordings were captured for each trial. The sagittal plane (side view) of the users completing the task was captured. The spatial resolution of this view captured the user, light fixture and ladder. The temporal resolution of the video was captured at 60 frames per second (60 Hz).

Data Analysis

Video data was post-processed in commercial video editing software to permit frameby-frame analysis (Adobe Premiere Pro, San Jose, CA). Onset, offset and occurrence of task-based measures were denoted along the video timeline via 'Markers' (marker is defined in this report as an event occurring at a specific time). All 'Markers' were assessed by single biomechanist (i.e. a human-movement expert) to promote consistency and accuracy across users and conditions. Specifics defining each timebased measure are as follows: Time on the ladder (Figure 2, green marker) – from first foot onset with the ladder to last foot offset with the ladder.



Figure 2: Green marker denoting ladder onset, 'LADDER_ON'. Ladder offset denoted as 'LADDER_OFF'.

Time the arm above 90° (Figure 3, orange marker) – movement analysis of the left arm. From when the arm displayed visual shoulder flexion or abduction greater than 90°.



Figure 3: Orange marker denoting left arm above 90° onset, 'SHO_90_ON'. Arm above 90° offset denoted as 'SHO_90_OFF'.

Time holding the fixture (Figure 4, purple marker) – from loading one or both of the upper arms with the weight of the light fixture to off-loading the weight of the light fixture.



Figure 4: Purple marker denoting fixture load onset, 'FIXTURE_LOAD_ON'. Fixture load offset denoted as 'FIXTURE_LOAD_OFF'.

Dropped items (Figure 5, yellow marker) – occurrence of an item (e.g. tool, wire cap, light fixture) unintentionally dropping.



Figure 5: Yellow marker denoting occurrence of a dropped item, 'PART_DROP'.

End of uninstallation (Figure 6, white marker) – occurrence of the conclusion of the uninstallation phase.



Figure 6: White marker denoting occurrence of the end of uninstallation, 'END_OF_UNINSTALL'. End of WSCR installation denoted as 'END_OF_SKYX_INSTALL'.

End of WSCR installation (Figure 6, white marker) - occurrence of the conclusion of the WSCR installation phase.

Onsets, offsets and occurrence of markers were exported from Adobe Premiere Pro to a comma separated values (CSV) spreadsheet. The duration of timing events was quantified between onsets and offsets. The sum of timing durations and the sum of dropped item occurrences was calculated. Total summed time and occurrence of task-based measures were calculated for each user, condition and phase.
Statistical Analysis

To assess time differences of task-based measures between traditional and novel light fixture installation methods, one-way ANOVAs were performed on time-based measures with condition as the predictor variables. If condition was found to be significant, a Tukey's Honestly Significant Difference (HSD) post-hoc test was performed to assess which groups differed. To meet the assumptions of the parametric statistical analyses, natural logarithmic transformations were performed on task-based measures to achieve a normal data distribution. The occurrence of dropped items was not prevalent across all conditions to be tested statistically. We expect the **Traditional to Traditional** installation method to result in the longest time durations and most dropped item occurrences.

To confirm validity in the research design of this project, paired t-tests were performed on time-base measures (time on ladder, time holding fixture, time arm above 90°) within the uninstallation and installation phases between the **Traditional to Traditional** and **Traditional to WSCR/WSAF** conditions and **Traditional to WSCR/WSAF** and **WSAF** to **WSAF** conditions, respectively. We expected the null hypothesis to not be rejected in these tests due to task requirements being identical in these phases (i.e. both uninstalling a light fixture with the traditional method and both installing a light fixture with the novel method). Confirming these outcomes would suggests appropriate randomization in this project's study design.

Results

Results by Condition

The **Traditional to Traditional** condition resulted in a significantly greater time on the ladder (F_{2:27}=1034; p<0.001) (Figure 7), arm time above 90° (F_{2:27}=392; p<0.001) (Figure 8), and time holding the light fixture (F_{2:27}=34; p<0.001) (Figure 9) than the other two conditions. The **WSAF to WSAF** resulted in significantly less time on the ladder and arm time above 90° than the **Traditional to WSCR/WSAF** condition. The occurrence of dropped items was nearly exclusive to the **Traditional to Traditional** condition (Figure 10). The size of these effects was large. The time on ladder was over 20 minutes for the **Traditional to Traditional to WSCF/WSAF** and under 1 minute for the **WSAF to WSAF** condition. Thus, the presence of the ceiling receptacle reduces the time on the ladder by more than 90% (**WSAF to WSAF** compared to **Traditional to Traditional**). Furthermore, the time with an arm elevated above 90° was reduced from about 13 minutes for the **Traditional to WSCF/WSAF** and under 1 minutes for a **WSAF to WSAF** installation. The time holding the light fixture was also markedly reduced albeit a smaller effect than the other two

assessed time metrics. The user spent nearly 2 minutes holding the fixture in the **Traditional to Traditional** condition, which was reduced to under 1 minute in the **Traditional to WSCF/WSAF** and under half a minute in the **WSAF to WSAF** condition. Lastly, the average user dropped between 2 and 3 objects during **Traditional to Traditional** condition but these instances were rare for the other two installation conditions (Figure 10).



Figure 7: The average total time users spent on the ladder for each uninstallation/installation condition. Error bars denote the standard deviation. Nonmatching letters denote groups that are statistically different from one another.



Figure 8: The average total time users had their arm above 90° for each uninstallation/installation condition. Error bars denote the standard deviation. Non-matching letters denote groups that are statistically different from one another.



Figure 9: The average total time users were holding the light fixture for each uninstallation/installation condition. Error bars denote the standard deviation. Non-matching letters denote groups that are statistically different from one another.



Figure 10: The average total number of dropped items for each uninstallation/installation condition. Error bars denote the standard deviation. Note: no items were dropped during the WSAF to WSAF condition for all users in the project.

Results by Phase

There was no significant differences in time on ladder, time holding the fixture, and arm time above 90° during the uninstallation phase between the **Traditional to Traditional** and **Traditional to WSCR/WSAF** condition (Figure 11). Similarly, there was no significant differences in time on ladder, time holding the fixture, and arm time above 90° during the installation phase between the **Traditional to WSCR/WSAF** and **WSAF to WSAF** condition (Figure 12). Users were on the ladder for about 1 minute and had their arm above 90° for less than 1 minute during the WSCR installation phase (Figure 13). Users were not exposed to addition fixture holding time during the WSCR installation phase.



Figure 11: The average total time users spent on the ladder, time holding light fixture and time arm above 90° for each uninstallation phase all three conditions (a) and only two of the conditions (b, conditions that required a traditional uninstallation). Error bars denote the standard deviation.



Figure 12: The average total time users spent on the ladder, time holding light fixture and time arm above 90° for each installation phase all three conditions (a) and only two of the conditions (b, conditions that required a novel installation). Error bars denote the standard deviation.



Figure 13: The average total time users spent on the ladder, time holding light fixture and time arm above 90° for the WSCR installation phase for the traditional to WSCR/WSAF condition (the only condition with this phase). During this phase, there was no need for the user to hold the light fixture (no values). Error bars denote the standard deviation.

Interpretation of Results

This analysis determined that a weight-supporting plug-in attachment significantly reduces the time of hazardous and strenuous activities that are associated with light fixture installation and improves performance when considering all metrics that were considered in this study. Notably, the study revealed progressive improvements from a traditional light fixture replacement (**Traditional to Traditional** where a weight-supporting plug-in attachment was not used) to the installation and use of a weight-supporting plug-in attachment (**Traditional to WSCR/WSAF**) and then further improvement when replacing a fixture where the weight-supporting plug-in attachment was already installed (**WSAF to WSAF**). Given these results, the use of weight-supporting plug-in attachments are expected to reduce fatigue and upper extremity musculoskeletal injury risk (through reduced time spent with the arms elevated and reduced time spent holding the fixture). Furthermore, the use of these attachments are anticipated to reduce ladder fall risk compared to changing of light fixture without these attachments through a major reduction in time spent on the ladder and by reducing the impacts of fatigue. The high occurrence of dropped items suggests that performance is enhanced

by these attachments. Dropped items could lead to lost components during installation, which potentially exposes the user to injury risk (if they move abruptly on the ladder in an attempt to catch the falling object or in the case of dropping a large object like the fixture), and may require to complete additional corrective actions such as descending the ladder to retrieve a lost item and then repeating the task that was being conducted when it was dropped.

The analysis described in this report does not address all aspects of safety that may be relevant to light fixture installation. For example, several aspects of ladder fall risk were not considered including the weight distribution on the ladder (i.e., center of pressure) and its impact on tipping of the ladder, the ability of the user to respond to balance disturbances, and whether slip and fall risk might have been influenced during ascent and descent of the user on the ladder. Furthermore, direct measures of fatigue and tissue loading were not conducted, which would provide more detailed insights on musculoskeletal injury risk. Furthermore, the study is unable to estimate the magnitude of risk reduction for either fall risk or musculoskeletal injury.

Impact of Report

This final report provides supportive background, methodological procedures, results, and objective interpretation of ceiling light fixture installation across traditional and novel installation methods. Notably, the report concludes that weight-supporting plugin attachment offers substantial reductions in time spent on a ladder, time with elevated arm postures, time spent holding the light fixtures, and the number of dropped items. These findings indicate that these attachments are expected to reduce fall risk, reduce risk of upper extremity musculoskeletal injury risk, and enhance installation performance.

Knowledge gained from this report can assist in improving worker and homeowner safety. This report may be relevant as:

- Directed safety and injury risk information for workers and homeowners on ceiling fixture installation.
- Additional guidance for National Electrical Code (NEC) standards related to 314.27 Outlet Boxes (A) Boxes at Luminaire or Lampholder Outlets; (C) Boxes at Ceiling-Suspended (Paddle) Fan Outlets.

Appendix

User	Gender	Height (m)	Trial 1	Trial 2	Trial 3
1	М	1.85	Traditional to WSCR/WSAF	WSAF to WSAF	Traditional to Traditional
2	М	1.83	Traditional to Traditional	Traditional to WSCR/WSAF	WSAF to WSAF
3	М	1.83	Traditional to Traditional	Traditional to WSCR/WSAF	WSAF to WSAF
4	М	1.83	Traditional to WSCR/WSAF	Traditional to Traditional	Traditional to WSCR/WSAF
5	М	1.80	WSAF to WSAF	Traditional to Traditional	Traditional to WSCR/WSAF
6	W	1.60	WSAF to WSAF	Traditional to WSCR/WSAF	Traditional to Traditional
7	М	1.80	Traditional to Traditional	WSAF to WSAF	Traditional to WSCR/WSAF
8	М	1.75	Traditional to Traditional	Traditional to WSCR/WSAF	WSAF to WSAF
9	W	1.70	WSAF to WSAF	Traditional to WSCR/WSAF	Traditional to Traditional
10	М	1.83	Traditional to WSCR/WSAF	WSAF to WSAF	Traditional to Traditional

Appendix A: Randomization order of uninstallation/installation conditions by user.

Appendix B: Kichler Stetton 3-Light Anvil Iron Farmhouse Drum Hanging Pendant Light

Dimensions			
Chain Length (inches)	36	Size	Medium
Height (inches)	9.25	Weight (Ibs.)	10.031
Maximum Hanging Height (inches)	46	Width (inches)	18.5
Minimum Hanging Height (inches)	10	Wire Length (inches)	72

Appendix C: Diameter and weight of commercially available ceiling light fixtures.



Appendix D: Standard instructions to install a chain light fixture.



Appendix E: Instructions to install a weight supporting ceiling receptacle (WSCR).



https://skyx.vids.io/videos/4490d1b41d1ae1cdcd/install-the-skyoutlet

Appendix F: Instructions to install a weight-supporting attachment fitting (WSAF) for a chain fixture.



https://skyx.vids.io/videos/d390d1b41d1be5c35a/install-a-skyplug-chain-fixture

References

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Public Comme	ent No. 418-NFPA 70-2024 [Section No. 410.56]
IFFA	
410.56 Protection	on of Conductors and Insulation.
(A) Properly Se	cured.
Conductors shall	l be secured in a manner that does not tend to cut or abrade the insulation.
(B) Protection T	⁻ hrough Metal.
Conductor insula	ation shall be protected from abrasion where it passes through metal.
(C) Splices and	Taps.
No unnecessary not be located wi	splices or taps shall be made within or on a luminaire. Splices and taps shall ithin luminaire arms or stems.
(D) Stranding.	
Stranded conduct flexible parts.	ctors shall be used for wiring on luminaire chains and on other movable or
(E) Tension.	
Conductors shall tension on the co	l be arranged so that the weight of the luminaire or movable parts does not put onductors.
dditional Propose	d Changes
File Name Des CN 59.pdf	<u>scription</u> <u>Approved</u>
terterment of Duckle	and Outbotton for Dublic Comment
tatement of Proble	and Substantiation for Public Comment
NOTE: The following	
	g CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828.
The Correlating Correlating Correlating Correlation (410.56(C)) with enforce	g CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. nmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary prceable text (NEC Style Manual Section 3.2.1).
The Correlating Com (410.56(C)) with enfo	nmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary prceable text (NEC Style Manual Section 3.2.1). Related Item
The Correlating Com (410.56(C)) with enfo • First Revision No. 8	a CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. nmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). <u>Related Item</u> 3828
The Correlating Com (410.56(C)) with enfo • First Revision No. 8 ubmitter Informati	g CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. Inmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). Related Item 3828 On Verification
The Correlating Com (410.56(C)) with enfo • First Revision No. 8 ubmitter Informati Submitter Full Nam	 g CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. Inmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). <u>Related Item</u> 3828 Ion Verification e: CC Notes
The Correlating Com (410.56(C)) with enfo • First Revision No. 8 ubmitter Informati Submitter Full Nam Organization:	 a CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. a mmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). Related Item 8828 On Verification re: CC Notes NEC Correlating Committee
The Correlating Com (410.56(C)) with enfo • First Revision No. 8 ubmitter Informati Submitter Full Nam Organization: Street Address:	 a CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. a mmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). Related Item 8828 No Verification ie: CC Notes NEC Correlating Committee
The Correlating Com (410.56(C)) with enfo • First Revision No. & ubmitter Informati Submitter Full Nam Organization: Street Address: City:	 a CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. a nmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). Related Item 8828 Non Verification ne: CC Notes NEC Correlating Committee
The Correlating Com (410.56(C)) with enfo • First Revision No. & ubmitter Informati Submitter Full Nam Organization: Street Address: City: State:	a CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. mmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). <u>Related Item</u> 8828 ion Verification He: CC Notes NEC Correlating Committee
The Correlating Com (410.56(C)) with enfo • First Revision No. & ubmitter Informati Submitter Full Nam Organization: Street Address: City: State: Zip: Submittel Deter	a CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. Inmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). Related Item 8828 Ion Verification Ie: CC Notes NEC Correlating Committee The Jul 20 15:E4:46 EDT 2024
The Correlating Com (410.56(C)) with enfo • First Revision No. & ubmitter Informati Submitter Full Nam Organization: Street Address: City: State: Zip: Submittal Date: Committee:	CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. nmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). Related Item 8828 ion Verification ie: CC Notes NEC Correlating Committee Tue Jul 30 15:54:46 EDT 2024 NEC-P18
The Correlating Com (410.56(C)) with enfo • First Revision No. & ubmitter Informati Submitter Full Nam Organization: Street Address: City: State: Zip: Submittal Date: Committee:	CC Note No. 59 appeared in the First Draft Report on First Revision No. 8828. nmittee directs that CMP 18 review FR 8828 and consider replacing "unnecessary orceable text (NEC Style Manual Section 3.2.1). <u>Related Item</u> 8828 ion Verification ne: CC Notes NEC Correlating Committee Tue Jul 30 15:54:46 EDT 2024 NEC-P18

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7989-NFPA 70-2024</u>
Statement:	Removed "No unnecessary splices or taps shall be made within or on a luminaire" because it is unenforceable and already addressed by product safety standards required for listing.

Correlating Committee Note No. 59-NFPA 70-2024 [Section No. 410.56]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:17:11 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 8828 and consider replacing "unnecessary" (410.56(C)) with enforceable text (NEC Style Manual Section 3.2.1).

First Revision No. 8828-NFPA 70-2024 [Section No. 410.56]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A. Public Comment No. 1322-NFPA 70-2024 [Section No. 410.62(C)(1)]

(1) Cord-Connected Installation.

A luminaire or a listed assembly in compliance with any of the conditions in 410.62(C)(1)(a) through 410.62(C)(1)(c) shall be permitted to be cord connected provided the luminaire is located directly below the outlet or busway, the cord is not subject to strain or physical damage, and the cord is visible over its entire length except at terminations.

Informational Note: See 400.10, Uses Permitted, and 400.12, Uses Not Permitted.

(a) A luminaire shall be permitted to be connected with a cord terminating in a groundingtype attachment plug or busway plug. If grounding is not required in accordance with 410.42, a polarized-type plug shall be permitted.

(b) A luminaire assembly equipped with a strain relief and canopy shall be permitted to use a cord connection between the luminaire assembly and the canopy. The canopy shall be permitted to include a section of raceway not over 150 mm (6 in.) in length and intended to facilitate the connection to an outlet box mounted above a suspended ceiling.

(c) Listed luminaires connected using listed assemblies that incorporate manufactured wiring system connectors in accordance with 604.100(C) shall be permitted to be cord connected.

(<u>d</u>) <u>A luminaire with a cord connection shall be permitted to be terminated directly into an outlet</u> <u>box</u>. The cord must have proper stain relief, and the connection shall be documented in the

manufacturer's instructions.

Additional Proposed Changes

File Name

Description Approved

Department of Labor "Flexible Cord to a Luminaire" Bulletin.

eli_bulletin_cordconnectedlightingFlexibleCordForLuminaires_2023.pdf

Statement of Problem and Substantiation for Public Comment

This comment is being submitted on behalf of the Minnesota Department of Labor and Industry. Currently, the Department's inspection staff includes 14-office/field staff, 50-state field inspectors, 4-virtual inspectors and 22 plus contract electrical inspectors that complete over 170,000 electrical inspections annually.

Please revisit Pl 2032. The CMP is correct regarding the language written in C(1)(b); however, it is a very common practice to use flexible cord when installing luminaires which is allowed by 400.10. In most cases, it is a desirable installation to route the flexible cord whip directly into the outlet box. This language would allow a common practice when the cord installation is consistent with the parent text of 410.62(C) and is covered by the manufacturers instructions.

In addition, I have attached a document that our department previously created (and researched) to address this concern.

Related Item

• Public Input No. 2032-NFPA 70-2023 Section No. 410.62(C)(1)

Submitter Information Verification

Submitter Full Name: Dean HunterOrganization:Minnesota Department of LaborStreet Address:City:City:State:State:Zip:Submittal Date:Tue Aug 20 15:28:40 EDT 2024Committee:NEC-P18

Committee Statement

Committee Action:	Rejected
Resolution:	The proposed text conflicts with 400.10(A) that only allows use of flexible cord for connection to supply for pendants and portable luminaires, or for wiring of luminaires.

DEPARTMENT OF LABOR AND INDUSTRY

Flexible Cords Used for Connecting Luminaires

The use of flexible cord for the connection of luminaires has been debated for several years. The National Electrical Code (NEC) has specific requirements that allow for the installation to be made. However, the product standard, UL 1598 – Luminaires, allows the product manufacturers to require, through the installation instructions provided, how the connection can be made to the building's permanent wiring system. The scenarios illustrated below are the department's interpretation on using flexible cord for connecting luminaires that are consistent with the requirements of UL 1598.

For the following three scenarios:

- NEC 400.10(A)(2) allows flexible cord to be used for connecting a luminaire
- The luminaire is required to be listed (NEC 410.6)
- If the luminaire is installed independent from the outlet box, the installation would be required to comply with NEC 410.24.

**NEC 410.24 refers the installer to NEC 410.62(B) if adjustable, and 410.62(C) if permanently mounted

- Assuming the fixture is not adjustable, NEC 410.62(C)(1) states: The luminaire or listed assembly shall be installed so the cord is directly below the outlet box, visible the entire length, has strain relief, and won't be exposed to physical damage. If all the conditions are met, the cord is allowed to be connected by one of the following means in (a) through (c).
 - (a) Grounding type attachment plug
 - (b) Luminaire assembly with strain relief and canopy
 - (c) Listed luminaires utilizing a manufactured wiring system

Scenario #1: Luminaire is shipped without a pre-wired factory-supplied cord, and the installer wishes to use cord as the wiring method. What options does the installer have?

In this particular case, since the luminaire didn't come as a luminaire assembly (prewired factory-supplied cord with the fixture), the cord shall terminate in a grounding type attachment plug according to (a).

Scenario #2: Luminaire with a pre-wired factory-supplied cord assembly. However, the manufacturer's instructions don't mention the canopy or how to terminate the cord. What options does the installer have?

In this situation, because the luminaire was manufactured with a cord assembly, either NEC 410.62(C)(1)(a) or (b) would apply. Under part (a), the luminaire cord could terminate in a grounding-type attachment plug. Alternatively, part (b) would allow the cord to be field installed with strain relief through an outlet box cover (4 square or bell box blank cover), a field installed generic decorative canopy, or an optional accessory canopy or canopy assembly supplied by the manufacturer.

Scenario #3: Luminaire with a pre-wired factory-supplied cord assembly. The manufacturer's instructions allow the cord to terminate in the side of the field installed outlet box.

If the manufacturer's instructions clearly allow for the installation to be done by entering in the side of an outlet box with strain relief, the installation will be considered to be in compliance with the NEC and the manufacturer's installation instructions.



Public Comment No. 419-NFPA 70-2024 [Section No. 410.136(B)]

(B) Combustible Low-Density Cellulose Fiberboard.

Where a surface-mounted luminaire containing a ballast, transformer, LED driver, or power supply is to be installed on combustible low-density cellulose fiberboard, it shall be marked for this condition or be spaced not less than 38 mm ($1\frac{1}{2}$ in.) from the surface of the fiberboard. Where such luminaires are partially or wholly recessed, 410.110 through 410.118 shall apply.

Informational Note: See ASTM E84-2023c, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723-2018, *Standard for Test for Surface Burning Characteristics of Building Materials*. Combustible low-density cellulose

fiberboard includes sheets, panels, and tiles that have a density of 320 kg/m³ (20 lb/ft³) or less and are formed of bonded plant fiber material but does not include solid or

laminated wood or fiberboard that has a density in excess of 320 kg/m³ (20 lb/ft³) or is a material that has been integrally treated with fire-retarding chemicals to the degree that the flame spread index in any plane of the material will not exceed 25, determined in accordance with tests for surface burning characteristics of building materials.

Additional Proposed Changes

File NameDescriptionApprovedCN 60.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 60 appeared in the First Draft Report on First Revision No. 7984.

The Correlating Committee directs that CMP 18 review the dates for ASTM E84, as the Committee Statement indicates the most current version is referenced (2023c);however, a newer version (2023d) is published.

Related Item

• First Revision No. 7984

Submitter Information Verification

Submitter Full Name: CC NotesOrganization:NEC Correlating CommitteeStreet Address:City:State:Zip:Submittal Date:Tue Jul 30 15:56:23 EDT 2024Committee:NEC-P18

Committee Statement

Committee Action: Rejected but see related SR

Resolution:	<u>SR-7990-NFPA 70-2024</u>
Statement:	Reference standard years are being updated to the latest edition

Correlating Committee Note No. 60-NFPA 70-2024 [Section No. 410.136(B)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:19:52 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review the dates for ASTM E84, as the Committee Statement indicates the most current version is referenced (2023c); however, a newer version (2023d) is published.

First Revision No. 7984-NFPA 70-2024 [Section No. 410.136(B)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

NF	Public Comment No. 420-NFPA 70-2024 [Section No. 410.137(C)]
	(C) Wired Luminaire Sections.
	Wired luminaire sections are paired, with a ballast(s) or LED driver(s) to supply a light source or light sources in both. For interconnection between paired units, it shall be permissible to use metric designator 12 (trade size ³ () flexible metric conduit in lengths not exceeding 7.5 m

metric designator 12 (trade size $\frac{3}{8}$) flexible metal conduit in lengths not exceeding 7.5 m (25 ft), installed in accordance with Article 348, Part II. Luminaire wire operating at line voltage, supplying only the ballast(s) or LED driver(s) of one of the paired luminaires, shall be permitted in the same raceway as the light source supply wires of the paired luminaires where the voltage rating of the light source supply wires is greater than the line voltage.

Additional Proposed Changes

File NameDescriptionApprovedCN_61.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 61 appeared in the First Draft Report on First Revision No. 7985.

The Correlating Committee directs that CMP 18 review FR 7985 to clarify 410.137(C)and consider a list format or short, simple (and complete) declarative sentences (NEC Style Manual Section 3.5.1.1).

Related Item

• First Revision No. 7985

Submitter Information Verification

Submitter Full Name	: CC Notes
Organization: NEC Correlating Committee	
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Jul 30 16:14:36 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-7992-NFPA 70-2024</u>
Statement:	Changed into a list format wording to comply with Section 3.5.1.1 of the NEC Style Manual.
	The language was revised in list item 2 to reflect similar language in 300.5.

Correlating Committee Note No. 61-NFPA 70-2024 [Section No. 410.137(C)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:21:02 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review FR 7985 to clarify 410.137(C) and consider a list format or short, simple (and complete) declarative sentences (NEC Style Manual Section 3.5.1.1).

First Revision No. 7985-NFPA 70-2024 [Section No. 410.137(C)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Com	ment No. 421-NFPA 70-2024 [Section No. 410.140(A)]			
(A) Listing.	(A) Listing.			
Electric-disch listed and ins	Electric-discharge lighting systems with an open-circuit voltage exceeding 1000 volts shall be listed and installed in conformance with that listing.			
Additional Propo	osed Changes			
File Name CN_62.pdf	Description Approved			
Statement of Pro	blem and Substantiation for Public Comment			
NOTE: The follow	ving CC Note No. 62 appeared in the First Draft Report.			
The Correlating C shall be located in to 110.3(B).	Committee directs that CMP 18 review 410.140(A) "listing", as "Listing Requirements" n 410.2. In addition, the language requiring conformance with that listing is redundant			
Correlating Con	nmittee Note No. 62			
Submitter Inform	nation Verification			
Submitter Full N	ame: CC Notes			
Organization:	NEC Correlating Committee			
Citv:				
State:				
Zip:				
Submittal Date:	Tue Jul 30 16:15:54 EDT 2024			
Committee:	NEC-P18			
Committee State	Committee Statement			
Committee Action:	Rejected but see related SR			
Resolution:	<u>SR-7970-NFPA 70-2024</u>			
Statement:	List item A is being deleted as it has been added to the listing requirements in 410.2. See related resolution to PC 698 (SR 7968)			

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Correlating Committee Note No. 62-NFPA 70-2024 [Section No. 410.140(A)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:22:28 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs that CMP 18 review 410.140(A) "listing", as "Listing Requirements" shall be located in 410.2. In addition, the language requiring conformance with that listing is redundant to 110.3(B).

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James

Williams, David A.

Public Comment No. 422-NFPA 70-2024 [Section No. 410.184] 410.184 Ground-Fault Circuit-Interrupter (GFCI) Protection and Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection. Lighting equipment identified for horticultural use and employing flexible cords with one or more separable connectors or attachment plugs shall be supplied by lighting outlets protected in accordance with 410.184(A) or 410.184(B). (A) 150 Volts or Less to Ground. Branch circuits rated 150 volts or less to ground, single- or 3-phase, shall be provided with a listed Class A GFCI. (B) Above 150 Volts to Ground. Branch circuits rated above 150 volts to ground, single- or 3-phase, shall be provided with a listed SPGFCI with a ground-fault trip current not exceeding 20 mA. SPGFCI protective equipment that is listed only for use with protected equipment that employs a double insulation system shall not be used for this purpose. Informational Note: See UL 943C-2012, Outline of Investigation for Special Purpose Ground-Fault Circuit-Interrupters, for information on special installation considerations necessary for special purpose ground-fault circuit interrupters. **Additional Proposed Changes** File Name Description Approved CN 64.pdf Statement of Problem and Substantiation for Public Comment NOTE: The following CC Note No. 64 appeared in the First Draft Report on First Revision No. 8189. The Correlating Committee directs that CMP 18 review FR 8189 and revise the wording used to express the voltage limits to comply with NEC Style Manual Section 3.2.2. **Related Item** First Revision No. 8189 Submitter Information Verification Submitter Full Name: CC Notes Organization: **NEC Correlating Committee** Street Address: Citv: State: Zip: Submittal Date: Tue Jul 30 16:17:33 EDT 2024 Committee: NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8001-NFPA 70-2024</u>
Statement:	To comply with Section 3.2.2 of the NEC Style Manual, the headings were changed.

Correlating Committee Note No. 64-NFPA 70-2024 [Section No. 410.184]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:24:58 EDT 2024

Committee Statement

CommitteeThe Correlating Committee directs that CMP 18 review FR 8189 and revise theStatement:wording used to express the voltage limits to comply with NEC Style Manual Section3.2.2.

First Revision No. 8189-NFPA 70-2024 [Section No. 410.184]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Co	mment No. 423-NFPA 70-2024 [Section No. 410.191]
410.191 L	isting.
Luminaires equipment.	intended to emit germicidal irradiation shall be listed and identified as germicidal
Additional Prop	oosed Changes
<u>File Name</u> CN_65.pdf	Description Approved
Statement of Pr	oblem and Substantiation for Public Comment
NOTE: The foll	owing CC Note No. 65 appeared in the First Draft Report on First Revision No. 7990.
The Correlating located in 410.2	g Committee directs that CMP 18 review FR 7990, as "listing requirements" shall be 2.
• First Revision	Related Item No. 7990
Submitter Infor	mation Verification
Submitter Full	Name: CC Notes
Organization: Street Address City: State: Zip:	NEC Correlating Committee
Submittal Date	Tue Jul 30 16:18:41 EDT 2024
Committee:	NEC-P18
Committee Stat	ement
Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8007-NFPA 70-2024</u>
Statement:	Germicidal products have photobiological risks and emphasis that they be identified as germicidal luminaires is needed. The listed portion is being removed as that is covered in 410.2

Correlating Committee Note No. 65-NFPA 70-2024 [Section No. 410.191]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:26:18 EDT 2024

Committee Statement

CommitteeThe Correlating Committee directs that CMP 18 review FR 7990, as "listingStatement:requirements" shall be located in 410.2.

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

- Ayer, Lawrence S.
- Bowmer, Trevor N.
- Hickman, Palmer L.
- Holub, Richard A.
- Jackson, Peter D.
- Kendall, David H.
- Manche, Alan
- Osborne, Robert D.
- Porter, Christine T.
- Schultheis, Timothy James
- Williams, David A.

Public Comment No. 424-NFPA 70-2024 [Sections 411.2, 411.3]

Sections 411.2, 411.3

411.2 Listing Requirements.

(A) Listed Systems.

The luminaires, power supply, and luminaire fittings (including the exposed bare conductors) of a low-voltage lighting system shall be listed for use as part of the same identified lighting system.

(B) Assembly of Listed Parts.

A lighting system assembled from the following listed parts shall be permitted:

(1) Low-voltage luminaires identified for the use

(2) Power supply identified for the use

(3) Low-voltage luminaire fittings identified for the use

(4) Suitably rated cord or cable, or any Chapter 3 wiring method for the secondary circuit

411.3 Reconditioned Equipment.

Reconditioned low-voltage lighting systems or a lighting system assembled from reconditioned parts shall not be installed.

Additional Proposed Changes

File NameDescriptionApprovedCN 66.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 66 appeared in the First Draft Report on First Revision No. 8831.

The Correlating Committee directs CMP 18 to review FR 8831 with respect to the parenthetical phrase in 411.2 (including the exposed bare conductors), as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1.

Additionally, CMP 18 shall review the use of the term "suitably" in 411.2(B)(4) as the term is vague and unenforceable. Refer to the NEC Style Manual Section 3.2.1.

Lastly, CMP 18 shall consider revising the text in 411.3 to align with recommended wording regarding reconditioning. The recommended wording is "The installation of reconditioned low-voltage lighting systems or a lighting system assembled from reconditioned parts shall not be permitted."

Related Item

First Revision No. 8831

Submitter Information Verification

Submitter Full Name: CC NotesOrganization:NEC Correlating CommitteeStreet Address:

City:		
State:		
Zip:		
Submittal Date	Tue Jul 30 16:20:03 EDT 2024	
Committee:	NEC-P18	
Committee Statement		
Committee Action:	Rejected but see related SR	

Resolution:	<u>SR-8048-NFPA 70-2024</u>
Statement:	Parenthetical expressions have been removed from 411.2 for consistency with the NEC Style Manual Section 3.5.1.1.

The vague and unenforceable term "Suitablye" was removed in 411.2(B)(4) and replaced to comply to the NEC Style Manual Section 3.2.1.

Correlating Committee Note No. 66-NFPA 70-2024 [Sections 411.2, 411.3]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:27:41 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs CMP 18 to review FR 8831 with respect to the parenthetical phrase in 411.2 (including the exposed bare conductors), as parenthetical expressions create confusion and misunderstanding and shall be avoided. See the NEC Style Manual Section 3.5.1.1.

Additionally, CMP 18 shall review the use of the term "suitably" in 411.2(B)(4) as the term is vague and unenforceable. Refer to the NEC Style Manual Section 3.2.1.

Lastly, CMP 18 shall consider revising the text in 411.3 to align with recommended wording regarding reconditioning. The recommended wording is "The installation of reconditioned low-voltage lighting systems or a lighting system assembled from reconditioned parts shall not be permitted."

First Revision No. 8831-NFPA 70-2024 [Section No. 411.2]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S.

Bowmer, Trevor N.

Hickman, Palmer L.

Holub, Richard A.

Jackson, Peter D.

Kendall, David H.

Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.

Public Co	omment No. 1452-NFPA 70-2024 [Section No. 411.3]		
411.3 Red	conditioned Equipment.		
Reconditio parts shall	Reconditioned low-voltage lighting systems or a lighting system assembled from reconditioned parts shall not be installed permitted .		
Statement of P This public co language in th pertains to the existing langu	Problem and Substantiation for Public Comment mment is made to address an issue with the first draft language changes. The proposed is first revision allows electrical equipment to be reconditioned in place as the language installation process and not to when any equipment is reconditioned in place. With the age in this first revision, the only time reconditioned equipment would not be permitted is		
if it is being in being made. T <u>Rel</u> • FR 8831	stalled. The Code does apply to existing equipment when additions or modifications are The proposed language change from "installed" to "permitted" is more inclusive. ated Item		
Submitter Info	rmation Verification		
Submitter Ful	II Name: Thomas Domitrovich		
Organization	Eaton Corporation		
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State:			
Zip:			
Submittal Dat Committee:	te: Fri Aug 23 09:04:55 EDT 2024 NEC-P18		
Committee Sta	itement		
Committee Action:	Rejected but see related SR		
Resolution:	<u>SR-8050-NFPA 70-2024</u>		
Statement:	The text of article 411.3 was modified to "The installation of reconditioned low-voltage lighting systems or a lighting system assembled from reconditioned parts shall not be permitted" to align with recommended wording and list structure regarding reconditioning.		

Public Comm	ent No. 425-NFPA 70-2024 [Section No. 411.4]
	tage Lighting Systems
Low-voltage lig and associated supply shall be	Age Lighting Systems. hting systems shall consist of an isolating power supply, low-voltage luminaires, equipment that are all identified for the use. The output circuits of the power rated for 25 amperes maximum under all load conditions.
(A) Power Sup	ply Limitation.
The output circu conditions.	its of the power supply shall be rated for 25 amperes maximum under all load
(B) Voltage Lin	nitations.
The operating v not exceed 30 v low-voltage ligh 30 volts dc.	oltage of low-voltage lighting systems and their associated components shall volts ac or 60 volts dc. If wet contact is likely to occur, the operating voltage of ting systems and their associated components shall not exceed 15 volts ac or
Informatic	nal Note: See 680.1 for swimming pools, fountains, and similar installations.
Statement of Probl	em and Substantiation for Public Comment
NOTE: The followin	g CC Note No. 67 appeared in the First Draft Report on First Revision No. 8159.
The Correlating Cor is duplicated wordin under all load condi	mmittee directs CMP 18 to review FR 8159 with respect to 411.4and 411.4(A) that ng. "The output circuits of the power supply shall be rated for 25 amperes maximum itions" and delete one of the sentences.
	Related Item
 First Revision No. 	8159
Submitter Informat	ion Verification
Submitter Full Nan	ne: CC Notes
Organization:	NEC Correlating Committee
Street Address:	
City:	
State:	
ZIP: Submittel Deter	Tue Jul 30 16:21:34 EDT 2024
Submittal Date.	

Committee Statement

Г

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8052-NFPA 70-2024</u>
Statement:	The duplicate wording "The output circuits of the power supply shall be rated for 25 amperes maximum under all load conditions." in section 411.4 was removed because it is stated in the 411.4(A).
Correlating Committee Note No. 67-NFPA 70-2024 [Section No. 411.4]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:30:03 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs CMP 18 to review FR 8159 with respect to 411.4 and 411.4(A) that is duplicated wording. "The output circuits of the power supply shall be rated for 25 amperes maximum under all load conditions" and delete one of the sentences.

First Revision No. 8159-NFPA 70-2024 [Sections 411.3, 411.4]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.



Article 420 Multifunction Platforms

Part I. General

420.1 Scope. This article covers requirements for multifunction platforms and their associated components to provide functions and power. Devices that provide multiple functions and do not provide means for connection of other utilization equipment are not within the scope of this article.

420.2 Listing. Multifunction platforms shall be listed.

(1)

(a) <u>Reconditioning.</u> <u>Reconditioned multifunction platforms shall not be</u> <u>installed.</u>

Part II. Installation

420.10 Uses Permitted. Multifunction platforms shall be permitted to provide integral functions and to connect and support utilization equipment in accordance with 420.10(A) and 420.10(B).

(A) Integral Components. Multifunction platforms shall be permitted to have components that provide integral functions in accordance with the listing, such as:

(1) Internet connectivity

(2) Monitoring of the elderly (fall detection, presence, and other conditions)

(3) Occupancy detection

(4) Environmental monitoring

(5) Security cameras

(6) Speakers

(B) Attachment of Utilization Equipment. Multifunction platforms shall be permitted to connect and support utilization equipment provided with a weight-supporting attachment fitting (WSAF) in accordance with 314.27(D) and 314.27(E).

(C) Single Unit Installation. The multifunction platform shall not:

(1) Be stacked to another multifunction platform

(2) Supply more than one external utilization equipment

<u>420.12 Uses Not Permitted.</u> <u>Multifunction platforms, including any</u> <u>attached utilization equipment, shall not be permitted to:</u>

(1) Exceed the marked weight limit of the outlet box and weightsupporting ceiling receptacle (WSCR) in accordance with 314.27

(2) Be installed in hazardous (classified) locations except as permitted by other articles in this code

(3) Provide detector or annunciator functions for a fire alarm system

(4) Have utilization equipment connected, or have integral functions included, that are not permitted to be connected to a receptacle by other parts of this code

(5) Be attached to a box complying with 314.27(D), Exception

(6) Connect any air moving device such as a ceiling mounted paddle fan

Informational Note: Air moving devices can potentially interfere with smoke alarm functions in the multifunctional platform

<u>420.14 Electrical Connection.</u> <u>Multifunction platforms shall be connected</u> <u>using a WSAF.</u>

Informational Note: See ANSI/NEMA WD-6, American National Standard for Wiring Devices–Dimensional Specifications, for standard configurations of WSCR and WSAF.

<u>420.16 Wet and Damp Locations.</u> <u>Multifunction platforms shall comply</u> <u>with one of the following:</u>

(1) Where installed in wet locations, marked as suitable for wet locations

(2) Where installed in damp locations, marked as suitable for damp or suitable for wet locations

<u>Informational Note No. 1: See 410.10(A) for luminaires permitted in</u> <u>damp or wet locations.</u>

Informational Note No. 2: See 410.10(D) for luminaires permitted in tub and shower areas.

<u>420.24 Disconnecting Means.</u> <u>The WSAF in combination with the WSCR</u> <u>shall be permitted as the disconnecting means for the platform and for any</u> <u>attached utilization equipment.</u>

<u>420.30 Securing and Supporting.</u> <u>Multifunction platforms shall be</u> <u>installed to an outlet box in accordance with 314.27(A), using a WSCR in</u> <u>accordance with 314.27(E).</u>

Part III. Markings

<u>420.100 Nameplate.</u> <u>Multifunction platforms shall be provided with a</u> <u>nameplate marked with the manufacturer's name and model number, and</u> <u>the rating in volts and amperes.</u>

<u>420.120 Markings.</u> In addition to the markings required in 420.100, the marking on the multifunction platform shall specify all of the following:

(1) The maximum weight limit of attached utilization equipment

(2) Suitability for other than dry locations

(3) Mounting orientation

Statement of Problem and Substantiation for Public Comment

SUBSTANTIATION

The plug-and-play, multifunction platform is a new and innovative product class that is intended to allow other products to interface and be installed safely. The multifunction platform is not a proprietary product. This new product class incorporates a number of integral functions that go beyond those currently covered by many existing articles, such as in Articles 410 and 422, as independent devices. The installation of this device is not currently addressed in the NEC.

WHY NEEDED IN THE NEC? A single article is needed because these devices combine a multitude of functions and capabilities within a single device. It is intended to allow similar products to interface and be installed safely. Much like other utilization equipment in Article 422 (such as luminaires, appliances, etc.), there needs to be information to the installer and inspector to ensure a safe installation. The proposed text provides to the installers and inspectors common code requirements, typically not included in product standards, such as:

- 1. Listing requirement
- 2. Device box requirements
- 3. Weight allowances
- 4. Permitted and prohibited uses
- 5. Reconditioning
- 6. Disconnecting means
- 7. Securing and supporting

Additionally, the applicable product standard or installation instructions may not be readily available to the inspector.

This public comment has been modified based on panel and stakeholder feedback with key elements as follows.

1. Title and scope. "WSCR" was removed to simplify the name and to ensure that requirements were not included in the title or scope, in accordance with the NEC Style Manual.

2. Revisions limit the connection to no more than one utilization equipment and only permit a single multifunction platform to be installed at any one location.

3. Text has been revised to prohibit air moving devices, such as paddle fans, due to potential interference with correct smoke alarm function.

4. Other editorial changes were made for user-friendliness and compliance with the NEC Style Manual.

MULTIFUNCTION PLATFORMS FACILITATE TIMELY REPLACEMENT IN A SAFER MANNER It is well known within the fire service that smoke alarms are not being replaced at the required end-oflife timeframe, 10 years. The technology for routers typically is obsolete after 3-5 years, creating a need for replacement and interchangeability by the owner/user on a frequent basis. The premise of a plug and play platform is to provide multiple functions and to facilitate ease and safety during replacement (smoke alarm) or upgrade (router).

WE HAVE ADDRESSED THE ELEMENTS IN THE PANEL STATEMENT

With regard to the product standard noted in the Panel Statement, a project has been initiated with UL to determine the requirements for a product standard for the multifunction platform. Although the listing is in process, there are many cases where the certification agencies/testing laboratories need to know the NEC installation requirements to ensure compatibility with the listing.

The panel raised concerns with smoke detectors. The multifunction platform is prohibited from having a smoke detector included, and is only permitted to have a smoke alarm. Additionally, installing the platform with ceiling fans is now prohibited so as not to interfere with the smoke alarm functions, in accordance with requirements in NFPA 72, National Fire Alarm and Signaling Code.

It was thought that the requirements proposed would not assist the inspectors and installers, however as detailed above, this text clearly assists the installer and inspectors, as they may not have access to the product standard or installation instructions. Installers and inspectors go to the code to find the installation requirements.

It was stated that the multifunction platform is just "utilization equipment". However, it is not just utilization equipment, as indicated in the panel statement. The platform is unique in that it is utilization equipment, but it is also a support mechanism for connection of other utilization equipment. This has an impact on the requirements for the device box, such as, the total weight permitted to be supported. As is the case with many other types of utilization equipment in the code, such as in Articles 410, 411, 422, etc., the platform needs to have these requirements in the code for the installer and the inspector.

The panel noted that the multifunction platform is already permitted. However, without the requirements provided in the proposed text, it is likely the unit would be installed incorrectly and potentially not detected by inspectors. For example, several could be connected together, there's no requirement to be listed, the assembly could be overloaded for the device box, and equipment could be reconditioned, etc.

Related Public Comments for This Document

Related Comment

Relationship

Public Comment No. 1119-NFPA 70-2024 [New Definition after Definition: Motor Fuel Dispensing Faci...] Public Comment No. 1119-NFPA 70-2024 [New Definition after Definition: Motor

Fuel Dispensing Faci...]

Related Item

• PI 2480 • PI 4324

Submitter Information Verification

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Submittal Date:	Thu Aug 15 11:05:07 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee
Action:RejectedResolution:A connected multi-function platform would be considered utilization equipment and
therefore is more appropriately addressed in a product safety standard. Regardless of
the connection method, this is not prohibited by the Code, therefore this product does
not need a new article. The submitter proposes requirements on ceiling boxes and that
might suggest revision to 314.27 for ceiling boxes to provide guidance to installers and
inspectors.

Public Comment No. 1799-NFPA 70-2024 [New Section after 411.8]

ARTICLE 412 Class 4 Fault Managed Power Lighting

412.1 Scope.

This article covers lighting systems that utilize Class 4 Fault Managed Power sources and their associated components.

412.2 Reconditioned Equipment.

<u>Listed limited-energy lighting systems or a lighting system assembled from listed parts</u> <u>shall not be reconditioned.</u>

412.3 Listed System.

<u>The luminaires, power supply, cabling, and luminaire fittings of a Class 4 Fault Managed</u> <u>Power lighting system shall be listed for use as part of the same identified lighting</u> <u>system.</u>

Informational Note: See 726.2 for listing requirements for Class 4 Fault Managed Power systems.

412.4 Wiring Methods

<u>All Class 4 Fault Managed Power circuits shall be installed using cabling specified by the</u> <u>manufacturer as being compatible with the Class 4 Fault Managed Power Transmitter</u> <u>and installed in accordance with Article 722 Part III.</u>

412.5 Specific Location Requirements.

412.5(A) Pools, Spas, Fountains, and Similar Locations.

Lighting systems shall be installed not less than 3 m (10 ft) horizontally from the nearest edge of the water, unless permitted elsewhere in this <u>Code</u>.

412.6 Class 4 Lighting Loads

<u>Class 4 Fault Managed Power receivers that are not integral to luminaires shall comply</u> with 726.122.

Statement of Problem and Substantiation for Public Comment

Class 4 Fault Managed Power (FMP) systems provide high-efficiency transmission of power using active safety monitors that can remove energy from the line before a fault can cause injury or fire. This seems counterintuitive, as these systems are permitted by the NEC to employ up to 450 Volts peak. However, by being required to detect both line to ground and line to line faults and disconnect power to them within milliseconds, these systems prevent ventricular fibrillation in the event of a guarding failure. Further, they are required to detect arc faults, overcurrent conditions, and short circuit conditions and disconnect power before a fire can start. While AFCI/GFCI systems have provided some of these safety features in the past, they remain susceptible to line-to-line faults as they cannot discriminate between a cable fault and valid utilization equipment current draw. Class 4 circuits are not permitted to exceed the risk of ventricular fibrillation, nor the risk of fire presented by Class 2 circuits, and in many cases present a risk FAR lower than that of a Class 2 circuit. For this reason, the 2023 NEC permitted these systems to utilize their own wiring Class 4

methods based on Class 2 circuits. The primary differences between Class 4 and Class 2 wiring center on insulation characteristics required by the higher peak voltage limit. Where a Class 2 cable is typically rated for 300V, a Class 4 cable must be rated to 450V.

The higher voltage employed by Class 4 FMP system results in lower currents and compatibility with higher efficiency DC power conversion equipment. This has generated significant interest in DC-based lighting systems that employ Class 4 FMP as a power distribution method. This public comment is in response to the panel's concerns during the First Draft phase around the proposed Article 412. Public Input 4470 proposed a combined "Limited Energy Lighting" chapter which combined Class 2 and Class 4 lighting systems into a single set of requirements. It's clear now, though, that that caused more confusion than necessary. The proposed Article 412 from this public comment distills the requirements for Class 4 lighting to its simplest essence. It covers three key topics – listing requirements, wiring methods, and loads, each of which have specific divergent requirements from Article 411 systems.

Class 4 FMP systems listed under UL 1400-1, the current listing standard, are required to be listed as a system to ensure that the FMP Transmitter, FMP Cable, and FMP Receiver are all compatible. Further, it ensures that these components were tested together to ensure that all required fault conditions can be reliably detected by each listed combination of components. This differs from Article 410 and Article 411, which permit the assembly of a system from unrelated, individually-listed components.

Class 4 FMP wiring methods are specified in Article 722, Part III. While these methods are very similar to those called out in Article 411, they are distinct in that the cabling must be a type specified by the Class 4 FMP Transmitter manufacturer to be compatible, and verified compatible through the product listing process.

Finally, Class 4 FMP systems often terminate in an FMP Receiver which then must be connected to utilization equipment, and that last connection is not protected by the FMP system. Where the FMP receiver is integral to a piece of utilization equipment, this connection is an internal connection and is properly addressed in the listing process for the utilization equipment. When the FMP receiver is discrete, then the output of the receiver is considered by the NEC to be a separately derived system unless that output circuit is itself a Class 2 circuit. This is detailed in 726.122 of the 2026 NEC First Draft and is referenced from 412.6 in the proposed Article 412.

Article 722 and 726 of the 2026 NEC First Draft permit the usage of Class 4 circuits broadly. The Proposed Article 412 highlights the concerns specific to FMP Lighting Systems, and provides users of the code with guidance for properly installing and inspecting such systems which have characteristics unlike any other lighting system permitted by the code.

Related Item

• PI 4470

Submitter Information Verification

Submitter Full Name: Jason Potterf	
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Submittal Date:	Tue Aug 27 12:53:17 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected
Resolution:	The proposed article text is not ready for adoption as it contains some NEC Style Manual errors, and some of the requirements need technical verification prior to
	acceptance. Areas such as specific location requirements for installation needs to be

justified and also its location within the NEC also needs to be identified. Additionally it is unclear if this new article is needed as it could be considered to be utilization equipment (Article 726).



411.8 Branch Circuit.

Lighting systems covered by this article <u>supplied by a Class 2 power source</u> <u>shall be</u> <u>installed in</u> <u>accordance with 725.127. Lighting systems</u> <u>supplied</u> <u>by power sources other than Class 2 power</u> <u>sources</u> <u>shall be supplied</u> from a maximum 20-ampere branch circuit.

Statement of Problem and Substantiation for Public Comment

Executive Summary

During the First Draft CMP 18 meeting, PI 4479 was found to be confusing as it was worded as an exception that pointed to another part of the code that also had an exception. Further, the panel expressed concerns around correlation with Article 210 which imposes limits on lighting outlets in dwelling units. The following substantiation supports the case for aligning Article 411 with Article 725 when a system relies on a listed Class 2 power source instead of creating a second overlapping requirement that applies only when a particular Class 2 power source, perhaps not designed specifically to power lighting equipment, is used to power a device that emits light. Further, detailed analysis of Article 210 is provided to highlight that Class 2 power sources are better classified as utilization equipment and as such their primary circuit connection is not made to a lighting outlet, thus removing the need to specify whether or not the installation is permitted in dwelling units.

During the NEC 2023 cycle, PI 4475-NFPA 70-2020 resulted in First Revision 9447-NFPA 70-2021, which removed the 20 Amp restriction on Class 2 and Class 3 Power Sources with the following Committee Statement:

"Power limited sources are no longer always supplied by a single transformer or power supply. Technologies such as PoE lighting require equipment with multiple Class 2 outputs that are supplied from a common equipment power source that can exceed the 20-ampere limit. For example, even a system with just forty-eight, 60-watt outputs would require almost 3KW. The 20-ampere is retained in the exception for the short lengths of lighter gauge wiring."

The result was the following revised text in 725.127 in the 2023 NEC which only allowed conductors smaller than 14 AWG when restricted to short lengths protected by 20-ampere branch circuits: "725.127 Wiring Methods on Supply Side of the Class 2 or Class 3 Power Source.

Conductors and equipment on the supply side of the power source shall be installed in accordance with the appropriate requirements of Chapters 1 through 4. Exception:

The input leads of a transformer or other power source supplying Class 2 and Class 3 circuits shall be permitted to be smaller than 14 AWG but not smaller than 18 AWG if they are protected by an overcurrent device rated not over 20 amperes, are not over 305 mm (12 in.) long, and have insulation that complies with 724.49(B)."

This same restriction on 20-ampere branch circuits exists in 411.8 as Article 411 was written at a time when a centrally installed multi-output LED power supply had not been contemplated as a means of lighting power distribution. With the rise of LED lighting, general-purpose switch-mode AC/DC Class 2 Power supplies have become common power sources for lighting systems. Such supplies operate more efficiently at higher loads, which incentivizes multi-output Class 2 power supplies. Systems exist on the market offering 12, 24, or even 48 circuits, all potentially supplied by a single power supply. The most common deployment for one such system based on PoE is via a 30-ampere circuit. The circuit is most often installed as an L6-30 receptacle in a raceway above a rack, connected via cord and plug to a Power Distribution Unit (PDU) that feeds multiple listed AC/DC switch mode power supplies. These connections are made in compliance with Chapters 1 - 4 of the NEC. These supplies combine their outputs to provide redundancy and ultimately supply multiple listed Class 2 outputs that are each limited to 100 VA.

When such a multi-output Class 2 power source supplies other Class 2 loads, such as IT equipment, security cameras, roller shades, HVAC equipment, or other loads suitable for a 100VA circuit, they are unambiguously permitted to be supplied by a 30-ampere branch circuit. However, if one of the outputs

is connected to device that emits light, the question arises if the point of connection to the branch circuit is now a "lighting outlet" or is still simply powering utilization equipment. In the 2023 NEC, 210.23(C) states:

"A 30-ampere branch circuit shall be permitted to supply fixed lighting units with heavy-duty lampholders in other than a dwelling unit(s) or utilization equipment in any occupancy. The rating of any one cord-and-plug-connected utilization equipment shall not exceed 80 percent of the branch-circuit ampere rating."

Thet term "utilization equipment" is defined in the code as "Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes" and therefore does not exclude any device simply because it emits light. A "Lighting Outlet" is also defined as "An outlet intended for the direct connection of a lampholder or luminaire." Under these definitions, the system described clearly meets the definition of utilization equipment and does not meet the definition of a lighting outlet as a lampholder or luminaire is not directly connected to the branch circuit, but instead to the secondary side of the Class 2 power source.

The term in question, though, is "fixed lighting unit" which is not defined in the code. The term "fixed" is defined in the code ("Equipment that is fastened or otherwise secured at a specific location.") but "lighting unit" is not defined specifically in the NEC despite being used, nor defined in applicable UL standards, nor Webster's Dictionary, our last resort. The term "Luminaire" uses this term in its definition, so one might reasonably surmise the term "lighting unit" is roughly synonymous with "luminaire":

"Luminaire.

A complete lighting unit consisting of a light source such as a lamp or lamps, together with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light. A lampholder itself is not a luminaire." This definition makes it clear that the luminaire is distinct and separate from the power supply. Returning to 210.23(C) which restricts "fixed lighting lighting units" but does not restrict "utilization equipment" in dwelling units, one could reasonably conclude that a centralized, multi-output Class 2 power source would be permitted as utilization equipment in any occupancy. After all, an identical system powering a security system comprised of PoE cameras would be clearly permitted, so why would camera with an integral spotlight connected to the exact same power source be more hazardous?

For completeness, it's worth mentioning that larger branch circuits have other, less relevant, restrictions. In other than dwelling units, 40- and 50-ampere branch circuits are permitted to supply lighting units with heavy duty lampholders, infrared heating units, or other utilization equipment by 210.23(d). Then, 210.23(e) permits branch circuits greater than 50 amperes to supply only "nonlighting outlet loads." A multi-output Class 2 power supply connection is clearly not a lighting outlet, and can be construed as utilization equipment. So the restrictions here are also not relevant. A strict reading of 210.23 would then say it is acceptable to power a multi-output Class 2 system using a 15-, 20-, 30-, or larger than 50-ampere circuit in any occupancy, but not a 40- or 50-ampere branch circuit in dwelling units. While this does not make a lot of sense, 210.23 is outside of the CMP 18 scope and fixing this would be new material for this code cycle, so we'll have to live with it as-is. This is why my suggestion is to simply require Class 2 power sources to be installed according to the applicable requirements in 725.127 instead of complicating matters with a second layer of overlapping requirements. Where Article 411 systems are not supplied by Class 2 power sources, Article 411's original requirements remain in full force.

Related Item

• PI 4479

Submitter Information Verification

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Submittal Date:	Tue Aug 27 12:55:06 EDT 2024

Committee:	NEC-P18
Committee Statement	
Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8054-NFPA 70-2024</u>
Statement:	Section 411.8 was revised to address the option of a low-voltage lighting systems to be supplied by a Class 2 power source installed in accordance with 725.127.

	Public Comment No.	1637-NFPA 70-2024 [Section No. 600.5(D)(1)]
NFPA		

(1) Supply.

The wiring method used to supply signs and outline lighting systems shall terminate within a sign, an outline lighting system enclosure, a suitable box, a conduit body, or an enclosed <u>a</u> panelboard.

Statement of Problem and Substantiation for Public Comment

FR 8903 has deleted the term "enclosed panelboard" from Article 100.

Related Item

• First Revision No. 8077-NFPA 70-2024 • First Revision No. 8903-NFPA 70-2024

Submitter Information Verification

Submitter Full Name	: Don Ganiere
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Zip:	
Submittal Date:	Sun Aug 25 20:47:09 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8032-NFPA 70-2024</u>
Statement:	The term enclosed panelboard has been removed from Article 100. Additionally the term panelboard is more accurate to the rest of the requirement.

Public Comment No. 427-NFPA 70-2024 [Section No. 600.6(A)]

(A) Location.

The disconnecting means shall be accessible and located in accordance with 600.6(A)(1), 600.6(A)(2), or 600.6(A)(3). If the disconnecting means is remote from the sign it controls, it shall comply with 600.6(A)(4).

(1) At Point of Entry to a Sign.

The disconnect shall be located at the point the feeder circuit or branch circuits supplying a sign or outline lighting system enters a sign enclosure, a sign body, or a pole in accordance with 600.5(D)(3). The disconnect shall open all ungrounded conductors where it enters the enclosure of the sign or pole.

Exception No. 1: A disconnect shall not be required for branch circuits or feeder conductors passing through the sign where not accessible and enclosed in a Chapter 3 listed raceway or metal-jacketed cable identified for the location.

Exception No. 2: A disconnect shall not be required at the point of entry to a sign enclosure or sign body for branch circuits or feeder conductors that supply an internal panelboard in a sign enclosure or sign body. The conductors shall be enclosed where not accessible in a Chapter 3 listed raceway or metal-jacketed cable identified for the location. A field-applied permanent hazard label that is visible during servicing shall be applied to the raceway at or near the point of entry into the sign enclosure or sign body. The danger label shall state the following: "Danger. This raceway contains energized conductors." The marking shall include the location of the disconnecting means for the energized conductors. The disconnecting means shall be capable of being locked in the open position.

(2) Within Sight of the Sign.

The disconnecting means shall be within sight of the sign or outline lighting system that it controls. Where the disconnecting means is out of the line of sight from any section that is able to be energized, the disconnecting means shall be lockable open in accordance with 110.25. A permanent field-applied marking identifying the location of the disconnecting means shall be applied to the sign in a location visible during servicing.

(3) Within Sight of the Controller.

The following shall apply for signs or outline lighting systems operated by electronic or electromechanical controllers located external to the sign or outline lighting system:

- (1) The disconnecting means shall be located within sight of the controller or in the same enclosure with the controller.
- (2) The disconnecting means shall disconnect the sign or outline lighting system and the controller from all ungrounded supply conductors.
- (3) The disconnecting means shall be designed such that no pole can be operated independently and shall be lockable open in accordance with 110.25.

Exception: Where the disconnecting means is not located within sight of the controller, a permanent field-applied marking identifying the location of the disconnecting means shall be applied to the controller in a location visible during servicing.

(4) Remote Location.

The disconnecting means, if located remote from the sign, sign body, or pole, shall be mounted at an accessible location available to first responders and service personnel. The location of the disconnect shall be marked with a label at the sign location and marked as the disconnect for the sign or outline lighting system.

Additional Proposed Changes

File NameDescriptionApprovedCN 68.pdf

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 68 appeared in the First Draft Report on First Revision No. 8083.

The Correlating Committee directs CMP 18 to review FR 8083 with respect to 600.6(A)(1) Exception No. 2 to clarify and consider a list format or short, simple declarative sentences (NEC Style Manual Section 3.5.1.1).

Additionally, CMP 18 shall review the last sentence in 600.6(A)(1) Exception No. 2and consider a reference to the applicable requirement in 110.25 regarding lockable open position.

Related Item

• First Revision No. 8083

Submitter Information Verification

Submitter Full Name: CC Notes	
Organization:	NEC Correlating Committee
Street Address:	
City:	
State:	
Zip:	
Submittal Date:	Tue Jul 30 16:23:40 EDT 2024
Committee:	NEC-P18

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-8033-NFPA 70-2024</u>
Statement:	The language is revised to comply with the NEC Style Manual (3.5.1.1) and to be consistent with other parts of this Code.

Correlating Committee Note No. 68-NFPA 70-2024 [Section No. 600.6(A)]

Submitter Information Verification

Committee: NEC-AAC Submittal Date: Tue May 07 16:31:47 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee directs CMP 18 to review FR 8083 with respect to 600.6(A)(1) Exception No. 2 to clarify and consider a list format or short, simple declarative sentences (NEC Style Manual Section 3.5.1.1).

Additionally, CMP 18 shall review the last sentence in 600.6(A)(1) Exception No. 2 and consider a reference to the applicable requirement in 110.25 regarding lockable open position.

First Revision No. 8083-NFPA 70-2024 [Section No. 600.6(A)]

Ballot Results

This item has passed ballot

- 12 Eligible Voters
- 1 Not Returned
- 11 Affirmative All
- 0 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

McDaniel, Roger D.

Affirmative All

Ayer, Lawrence S. Bowmer, Trevor N. Hickman, Palmer L. Holub, Richard A. Jackson, Peter D. Kendall, David H. Manche, Alan Osborne, Robert D. Porter, Christine T. Schultheis, Timothy James Williams, David A.