



National Fire Protection Association

1 Batterymarch Park, Quincy, MA 02169-7471
Phone: 617-770-3000 • Fax: 617-770-0700 • www.nfpa.org

WORKING DRAFT OF NEC CODE-MAKING **PANEL 6 MEETING OUTPUT**

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

Document: National Electrical Code®

Revision Cycle: A2025

Meeting Date: October 2024

Panel Activity: Comment Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Code-Making Panel 6 Second Draft Meeting. It includes draft copies of the Second Revisions and any Global Revisions.

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



[Move section 310.3 to 310.5]

310.3–5 Conductors.

(A) Minimum Size of Conductors.

The minimum size of conductors for voltage ratings up to and including 2000 volts shall be 16 AWG copper, 14 AWG copper-clad aluminum, or 12 AWG aluminum, except as permitted elsewhere in this code.

(B) Conductor Material.

Conductors in this article shall be of copper, aluminum, or copper-clad aluminum, unless otherwise specified. Aluminum and copper-clad aluminum shall comply with the following:

- (1) Solid aluminum conductors 8, 10, and 12 AWG shall be made of an AA-8000 series electrical grade aluminum alloy conductor material.
- (2) Stranded aluminum conductors 8 AWG through 1000 kcmil marked as Type RHH, RHW, XHHW, XHHN, XHWN, THW, THHW, THWN, THHN, service-entrance Type SE Style U, and SE Style R shall be made of an AA-8000 series electrical grade aluminum alloy conductor material.
- (3) For copper-clad aluminum conductors, the copper shall form a minimum 10 percent of the cross-sectional area of a solid conductor or each strand of a stranded conductor. The aluminum core of a copper-clad aluminum conductor shall be made of an AA-8000 series electrical grade aluminum alloy conductor material.

(C) Stranded Conductors.

Where installed in raceways, conductors 8 AWG and larger shall be stranded, unless specifically permitted or required elsewhere in this *Code* to be solid.

(D) Insulated.

Conductors not specifically permitted elsewhere in this *Code* to be covered or bare shall be insulated.

Informational Note: See 270.27 for insulation of neutral conductors of a solidly grounded high-voltage system.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 18:13:41 EDT 2024

Committee Statement

Committee Statement: A second revision was created that renumbers section 310.3 to 310.5. This action was taken to comply with the NEC Style Manual Section 2.2.1 on parallel numbering.

Response Message: SR-8425-NFPA 70-2024

[Public Comment No. 537-NFPA 70-2024 \[Section No. 310.3\]](#)



Second Revision No. 8472-NFPA 70-2024 [Detail]

Revise Table 310.4 as shown in the attached Word Document "Revision to 310_4." The revision simply makes an editorial correction revising the word "Extended" to "Extruded."

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_310_4.docx	Revision to 310.4	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 21:07:27 EDT 2024

Committee Statement

Committee Statement: A second revision was created to correct a misspelled word in the "TFE" column. The term "extended" will be replaced with "extruded."

Response Message: SR-8472-NFPA 70-2024

[Public Comment No. 362-NFPA 70-2024 \[Section No. 310.4\]](#)

310.4 Conductor Constructions and Applications.

Insulated conductors shall comply with Table 310.4(1) and Table 310.4(2).

Informational Note: Thermoplastic insulation may stiffen at temperatures lower than -10°C ($+14^{\circ}\text{F}$). Thermoplastic insulation may also be deformed at normal temperatures where subjected to pressure, such as at points of support.

Table 310.4(1) Conductor Applications and Insulations Rated 600 Volts

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation					Outer Covering ¹	
					AWG or kcmil	mm		mils			
Fluorinated ethylene propylene	FEP or FEPB	90°C	Dry and damp locations	Fluorinated ethylene propylene	14–10	0.51		20		None	
		(194°F)			8–2	0.76		30			
					14–8	0.36		14		Glass braid	
		200°C (392°F)	Dry locations — special applications ²	Fluorinated ethylene propylene	6–2	0.36		14		Glass or other suitable braid material	
Mineral insulation (metal sheathed)	MI	90°C	Dry and wet locations	Magnesium oxide	18–163	0.58		23		Copper or alloy steel	
		(194°F)				16–10	0.91		36		
		250°C	For special applications ²		9–4	1.27		50			
		(482°F)			3–500	1.40		55			
Moisture-, heat-, and oil-resistant	MTW	60°C (140°F)	Machine tool wiring in wet locations	Flame-retardant, moisture-, heat-, and		(A)	(B)	(A)	(B)	(A) None	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation					Outer Covering1
					AWG or kcmil	mm		mils		
thermoplastic		90°C (194°F)	Machine tool wiring in dry locations. Informational Note: See NFPA 79-2021, Electrical Standard for Industrial Machinery.	oil-resistant thermoplastic	22–12	0.76	0.38	30	15	(B) Nylon jacket or equivalent
					10	0.76	0.51	30	20	
					8	1.14	0.76	45	30	
					6	1.52	0.76	60	30	
					4–2	1.52	1.02	60	40	
					1–4/0	2.03	1.27	80	50	
					213–500	2.41	1.52	95	60	
					501–1000	2.79	1.78	110	70	
Paper		85°C (185°F)	For underground service conductors, or by special permission	Paper					Lead sheath	
Perfluoro-alkoxy	PFA	90°C (194°F)	Dry and damp locations	Perfluoro-alkoxy	14–10	0.51		20		None
					8–2	0.76		30		

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
		200°C (392°F)	Dry locations — special applications ²		1–4/0	1.14	45	
Perfluoro-alkoxy	PFAH	250°C (482°F)	Dry locations only. Only for leads within apparatus or within raceways connected to apparatus (nickel or nickel-coated copper only)	Perfluoro-alkoxy	14–10	0.51	20	None
					8–2	0.76	30	
					1–4/0	1.14	45	
Thermoset	RHH	90°C (194°F)	Dry and damp locations		14–10	1.14	45	Moisture-resistant, flame-retardant, nonmetallic covering ¹
					8–2	1.52	60	
					1–4/0	2.03	80	
					213–500	2.41	95	
					501–1000	2.79	110	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹		
					AWG or kcmil	mm	mils			
					1001 – 2000	3.18	125			
Moisture-resistant thermoset	RHW	75°C (167°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoset	14–10	1.14	45	Moisture-resistant, flame-retardant, nonmetallic covering		
					8–2	1.52	60			
					1–4/0	2.03	80			
	RHW-2	90°C (194°F)			213–500	2.41	95			
					501–1000	2.79	110			
					1001 – 2000	3.18	125			
Silicone	SA	90°C (194°F)	Dry and damp locations	Silicone rubber	14–10	1.14	45	Glass or other suitable braid material		
					8–2	1.52	60			
					1–4/0	2.03	80			
		200°C (392°F)	For special application ²		213–500	2.41	95			
					501–1000	2.79	110			

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
					1001 – 2000	3.18	125	
Thermoset	SIS	90°C (194°F)	Switchboard and switchgear wiring only	Flame-retardant thermoset	14–10	0.76	30	None
					8–2	1.14	45	
					1–4/0	1.40	55	
Thermoplastic and fibrous outer braid	TBS	90°C (194°F)	Switchboard and switchgear wiring only	Thermoplastic	14–10	0.76	30	Flame-retardant, nonmetallic covering
					8	1.14	45	
					6–2	1.52	60	
					1–4/0	2.03	80	
Extended Extruded polytetrafluoroethylene	TFE	250°C (482°F)	Dry locations only. Only for leads within apparatus or within raceways connected to apparatus, or as open wiring (nickel or nickel-coated)	Extruded polytetrafluoroethylene	14–10	0.51	20	None
					8–2	0.76	30	
					1–4/0	1.14	45	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
Heat-resistant thermoplastic	THHN	90°C	Dry and damp locations	Flame-retardant, heat-resistant thermoplastic	14–12	0.38	15	Nylon jacket or equivalent
		10			0.51	20		
		8–6			0.76	30		
		4–2			1.02	40		
		1–4/0			1.27	50		
		250–500			1.52	60		
		501–1000			1.78	70		
Moisture- and heat-resistant thermoplastic	THHW	75°C	Wet location	Flame-retardant, moisture- and heat-resistant thermoplastic	14–10	0.76	30	None
		(167°F)			8	1.14	45	
		90°C			6–2	1.52	60	
		Dry location	1–4/0		2.03	80		
			213–500		2.41	95		
			501–1000		2.79	110		
			(194°F)					

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
					1001 – 2000	3.18	125	
Moisture- and heat-resistant thermoplastic	THW	75°C	Dry and wet locations	Flame-retardant, moisture- and heat-resistant thermoplastic	14–10	0.76	30	None
		(167°F)			8	1.14	45	
		90°C	Special applications within electric discharge lighting equipment. Limited to 1000 open-circuit volts or less. (Size 14-8 only as permitted in 410.68.)		6–2	1.52	60	
		1–4/0			2.03	80		
		213–500			2.41	95		
		501–1000			2.79	110		
		1001 – 2000			3.18	125		
	THW-2	90°C (194°F)	Dry and wet locations					
Moisture- and heat-resistant thermoplastic	THWN	75°C	Dry and wet locations	Flame-retardant, moisture- and heat-resistant thermoplastic	14–12	0.38	15	Nylon jacket or equivalent
		(167°F)			10	0.51	20	
					8–6	0.76	30	
					4–2	1.02	40	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
	THWN-2	90°C (194°F)			1–4/0 250–500 501–1000	1.27 1.52 1.78	50 60 70	
Moisture-resistant thermoplastic	TW	60°C (140°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoplastic	14–10 8 6–2 1–4/0 213–500 501–1000 1001–2000	0.76 1.14 1.52 2.03 2.41 2.79 3.18	30 45 60 80 95 110 125	None
Underground feeder and branch-circuit cable — single conductor (for Type UF cable)	UF	60°C (140°F)	See Article 340, Part II.	Moisture-resistant	14–10 8–2 1–4/0	1.52 2.03 2.41	605 805 955	Integral with insulation

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
employing more than one conductor, see Article 340, Part II).		75°C (167°F) ⁴		Moisture- and heat-resistant				
Underground service-entrance cable — single conductor (for Type USE cable employing more than one conductor, see Article 338, Part II).	USE	75°C (167°F) ⁴	See Article 338, Part II.	Heat- and moisture-resistant	14–10	1.14	45	Moisture-resistant nonmetallic covering (See 338.2.)
	USE-2	90°C (194°F)	Dry and wet locations		8–2	1.52	60	
					1–4/0	2.03	80	
					213–500	2.41	95.6	
					501–1000	2.79	110	
					1001–2000	3.18	125	
Thermoset	XHH	90°C (194°F)	Dry and damp locations	Flame-retardant thermoset	14–10	0.76	30	None
					8–2	1.14	45	
					1–4/0	1.40	55	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
					213–500	1.65	65	
					501–1000	2.03	80	
1001 – 2000	2.41	95						
Thermoset	XHHN	90°C (194°F)	Dry and damp locations	Flame-retardant thermoset	14–12	0.38	15	Nylon jacket or equivalent
					10	0.51	20	
					8–6	0.76	30	
					4–2	1.02	40	
					1–4/0	1.27	50	
					250–500	1.52	60	
					501–1000	1.78	70	
Moisture-resistant thermoset	XHHW	90°C (194°F)	Dry and damp locations	Flame-retardant, moisture-resistant thermoset	14–10	0.76	30	None
		75°C (167°F)	Wet locations		8–2	1.14	45	
					1–4/0	1.40	55	
					213–500	1.65	65	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
					501–1000	2.03	80	
1001 – 2000	2.41	95						
Moisture-resistant thermoset	XHHW-2	90°C (194°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoset	14–10	0.76	30	None
					8–2	1.14	45	
					1–4/0	1.40	55	
					213–500	1.65	65	
					501–1000	2.03	80	
					1001 – 2000	2.41	95	
Moisture-resistant thermoset	XHWN	75°C (167°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoset	14–12	0.38	15	Nylon jacket or equivalent
					10	0.51	20	
					8–6	0.76	30	
	XHWN-2	90°C (194°F)			4–2	1.02	40	
					1–4/0	1.27	50	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			Outer Covering ¹
					AWG or kcmil	mm	mils	
					250–500	1.52	60	
					501–1000	1.78	70	
Modified ethylene tetrafluoro-ethylene	Z	90°C (194°F)	Dry and damp locations	Modified ethylene tetrafluoro-ethylene	14–12	0.38	15	None
		150°C (302°F)	Dry locations — special applications ²		10	0.51	20	
					8–4	0.64	25	
					3–1	0.89	35	
					1/0–4/0	1.14	45	
Modified ethylene tetrafluoro-ethylene	ZW	75°C (167°F)	Wet locations	Modified ethylene tetrafluoro-ethylene	14–10	0.76	30	None
		90°C (194°F)	Dry and damp locations					
		150°C (302°F)	Dry locations — special applications ²		8–2	1.14	45	
	ZW-2	90°C (194°F)	Dry and wet locations					

Note: Conductors in Table 310.4(1) shall be permitted to be rated up to 1000 volts if listed and marked.

1Outer coverings shall not be required where listed without a covering.

2Higher temperature rated constructions shall be permitted where design conditions require maximum conductor operating temperatures above 90°C (194°F).

3Conductor sizes shall be permitted for signaling circuits permitting 300-volt insulation.

4The ampacity of Type UF cable shall be limited in accordance with 340.80.

5Type UF insulation thickness shall include the integral jacket.

6Insulation thickness shall be permitted to be 2.03 mm (80 mils) for listed Type USE conductors that have been subjected to special investigations. The nonmetallic covering over individual rubber-covered conductors of aluminum-sheathed cable and of lead-sheathed or multiconductor cable shall not be required to be flame retardant.



Second Revision No. 8593-NFPA 70-2024 [Detail]

[Revise heading to 324.42 as follows:]

324.42 [Wiring](#) Devices.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 14:53:20 EDT 2024

Committee Statement

Committee Statement: The heading of 324.42 was revised to align with the new definition for "wiring device."

Response Message: SR-8593-NFPA 70-2024



[Add the new exception to 334.10(3)]

334.10 Uses Permitted.

Type NM and Type NMC cables shall be permitted to be used in the following, except as prohibited in 334.12:

- (1) One- and two-family dwellings and their attached or detached garages, and their storage buildings.
- (2) Multi-family dwellings and their detached garages permitted to be of Types III, IV, and V construction.
- (3) Other structures permitted to be of Types III, IV, and V construction. Cables shall be installed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

Exception to (3): Non-habitable grade level storage garages and storage buildings less than 1500 square feet with Type V construction shall be permitted to have Type NM and Type NMC installed without a 15-minute thermal barrier.

Informational Note No. 1: See NFPA 220-2024, *Standard on Types of Building Construction*, or the applicable building code, or both for types of building construction and occupancy classification definitions.

Informational Note No. 2: See Informative Annex E for determination of building types.

- (4) Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.

Informational Note No. 3: See 310.14(A)(3) for temperature limitation of conductors.

- (5) Types I and II construction where installed within raceways permitted in Types I and II construction.

(A) Type NM.

Type NM cable shall be permitted as follows:

- (1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3)
- (2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC.

Type NMC cable shall be permitted as follows:

- (1) For both exposed and concealed work in dry, wet, damp, or corrosive locations, except as prohibited by 334.10(3)
- (2) In outside and inside walls of masonry block or tile
- (3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (~~1~~¹/₁₆ in.) thick and covered with plaster, adobe, or similar finish

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 14:57:21 EDT 2024

Committee Statement

Committee Statement: Non-habitable storage buildings were added as an exception for the installation of NM cable in Type V construction due to its similarity to other locations where NM cable is permitted without a thermal barrier. The exception permits a limited square footage and is required to be at grade level, which allows for a quick means of egress.

Response Message: SR-8594-NFPA 70-2024

[Public Comment No. 1318-NFPA 70-2024 \[Section No. 334.10 \[Excluding any Sub-Sections\]\]](#)



[Revise Informational Note 2 to 334.10(3)]

334.10 Uses Permitted.

Type NM and Type NMC cables shall be permitted to be used in the following, except as prohibited in 334.12:

- (1) One- and two-family dwellings and their attached or detached garages, and their storage buildings.
- (2) Multi-family dwellings and their detached garages permitted to be of Types III, IV, and V construction.
- (3) Other structures permitted to be of Types III, IV, and V construction. Cables shall be installed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

Informational Note No. 1: See NFPA 220-2024, *Standard on Types of Building Construction*, or the applicable building code, or both for types of building construction and occupancy classification definitions.

Informational Note No. 2: See ~~Informative Annex E~~ [NFPA 5000 -2024 , *Building Construction and Safety Code*](#) . for determination of building types.

- (4) Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.

Informational Note No. 3: See 310.14(A)(3) for temperature limitation of conductors.

- (5) Types I and II construction where installed within raceways permitted in Types I and II construction.

(A) Type NM.

Type NM cable shall be permitted as follows:

- (1) For both exposed and concealed work in normally dry locations except as prohibited in 334.10(3)
- (2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC.

Type NMC cable shall be permitted as follows:

- (1) For both exposed and concealed work in dry, wet, damp, or corrosive locations, except as prohibited by 334.10(3)
- (2) In outside and inside walls of masonry block or tile
- (3) In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1.59 mm (**1/16** in.) thick and covered with plaster, adobe, or similar finish

Committee: NEC-P06

Submittal Date: Sat Oct 26 15:00:47 EDT 2024

Committee Statement

Committee Statement: Corrected reference per CC request.

Response Message: SR-8595-NFPA 70-2024

[Public Comment No. 557-NFPA 70-2024 \[Section No. 334.10\]](#)



[Revise Table 310.16 deleting the 18 size row and adding (2) notes at the bottom of the table]

310.16 Ampacities of Insulated Conductors in Raceway, Cable, or Earth (Directly Buried).

The ampacities shall be as specified in Table 310.16 where all of the following conditions apply:

- (1) Conductors are rated 0 volts through 2000 volts.
- (2) Conductors are rated 60°C (140°F), 75°C (167°F), or 90°C (194°F).
- (3) Wiring is installed in a 30°C (86°F) ambient temperature.
- (4) There are not more than three current-carrying conductors.

Table 310.16 Ampacities of Insulated Conductors with Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth (Directly Buried)

Size AWG or kcmil	Temperature Rating of Conductor [See Table 310.4(1)]						Size AWG or kcmil
	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	
	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, XHWN, USE, ZW	Types TBS, SA, SIS, FEP, FEPB, MI, PFA, RHH, RHW-2, THHN, THHW, THW- 2, THWN-2, USE-2, XHH, XHHW, XHHW-2, XHWN-2, XHHN, Z, ZW-2	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, XHWN, USE	Types TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW- 2, USE-2, XHH, XHHW, XHHW-2, XHWN-2, XHHN	
18*	—	—	14	—	—	—	—
16*	10	—	18	—	—	—	—
14*	15	20	25	10 [†]	—	—	14 [†]

12*	20	25	30	15	20	25	12*
10*	30	35	40	25	30	35	10*
8	40	50	55	35	40	45	8
6	55	65	75	40	50	55	6
4	70	85	95	55	65	75	4
3	85	100	115	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	145	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	195	230	260	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	350	420	475	285	340	385	600
700	385	460	520	315	375	425	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	445	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	525	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	555	665	750	470	560	630	2000

Notes:

1. Section 310.15(B) shall be referenced for ampacity correction factors where the ambient temperature is other than 30°C (86°F).

2. Section 310.15(C)(1) shall be referenced for more than three current-carrying conductors.

3. Section 310.16 shall be referenced for conditions of use.

4. Ampacity for 18 AWG copper Type MI and Type MTW shall be 14 amperes at 90°C (194 °F).

5. Ampacity for 16 AWG copper Type MI and Type MTW shall be 18 amperes at 90°C (194°F).

*Section 240.4(D) shall be referenced for conductor overcurrent protection limitations, except as modified elsewhere in the code.

[†]Ampacity shall be applicable only to copper-clad aluminum conductors.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Mon Oct 28 14:36:28 EDT 2024

Committee Statement

Committee Statement: To avoid conflict with the newly added 16 AWG copper conductor ampacities for 10-amp lighting circuits, the ampacities for Type MTW and Type MI in the 90C column are relocated to table notes. In the 1974 National Electrical Code Preprint, Part II, Proposal No. 84, CMP6 added ampacities for 18 AWG and 16 AWG copper to Tables 310-16 and 310-17 to provide ampacities for Type MTW, Type MI cable, and Type AVB (Asbestos and Varnished Cambric). Type AVB is no longer included in the NEC. In the 2023 NEC Table 310.4(1), the smallest Type MI cable conductor permitted is 18 AWG copper, and the smallest Type MTW conductor permitted is 22 AWG. The note included with Type MTW directs the Code user to see NFPA 79, which is where additional Type MTW material, size, and ampacity details are located.

Response Message: SR-8602-NFPA 70-2024



Second Revision No. 8471-NFPA 70-2024 [Section No. 310.3(A)]

(A) Minimum Size of Conductors.

The minimum size of conductors for voltage ratings up to and including 2000 volts shall be 16 AWG copper, 14 AWG copper-clad aluminum, or 12 AWG aluminum, except as permitted elsewhere in this code.

Informational Note: See 210.23 for permissible loading of branch-circuits.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 20:52:42 EDT 2024

Committee Statement

Committee Statement: The pointer provides a good reference for inspectors and installers in the field for permissible loads based on overcurrent protective device rating.

Response Message: SR-8471-NFPA 70-2024

Public Comment No. 1861-NFPA 70-2024 [Section No. 310.3(A)]



Second Revision No. 8416-NFPA 70-2024 [Section No. 310.4]

310.4 Conductor Constructions and Applications.

Insulated conductors shall comply with Table 310.4(1) and Table 310.4(2).

Informational Note: Thermoplastic insulation may stiffen at temperatures lower than -10°C (+14°F). Thermoplastic insulation may also be deformed at normal temperatures where subjected to pressure, such as at points of support.

Table 310.4(1) Conductor Applications and Insulations Rated 600 Volts

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation				
					AWG or kcmil	mm		mils	
Fluorinated ethylene propylene	FEP or FEPB	90°C (194°F)	Dry and damp locations	Fluorinated ethylene propylene	14–10 16–10	0.51		20	
					8–2	0.76		30	
		200°C (392°F)	Dry locations — special applications ²	Fluorinated ethylene propylene	14–8 16–8	0.36		14	
					6–2	0.36		14	
Mineral insulation (metal sheathed)	MI	90°C (194°F)	Dry and wet locations	Magnesium oxide	18–16 ³	0.58		23	
					16–10	0.91		36	
		250°C (482°F)	For special applications ²		9–4	1.27		50	
					3–500	1.40		55	
Moisture-, heat-, and oil-resistant thermoplastic	MTW	60°C (140°F)	Machine tool wiring in wet locations	Flame-retardant, moisture-, heat-, and oil-resistant thermoplastic	-		(A)	(B)	(C)
		90°C (194°F)	Machine tool wiring in dry locations.		22–12	0.76	0.38	30	1
					10	0.76	0.51	30	2
					-	8	1.14	0.76	4
					-	6	1.52	0.76	6
					-	4–2	1.52	1.02	6
					-	1–4/0	2.03	1.27	8
					-	213–500	2.41	1.52	9
					-	501–1000	2.79	1.78	11
					Informational Note: See NFPA 79-2021, <i>Electrical Standard for Industrial Machinery</i> .				
Paper	-		85°C (185°F)	For underground service conductors, or by special permission	Paper	-	-	-	
Perfluoro-alkoxy	PFA	90°C (194°F)	Dry and damp locations	Perfluoro-alkoxy	14–10 16–10	0.51		20	
					8–2	0.76		30	
		200°C (392°F)	Dry locations — special applications ²		1–4/0	1.14		45	
					-	-		-	
Perfluoro-alkoxy	PFAH	250°C (482°F)	Dry locations only. Only for leads within apparatus or	Perfluoro-alkoxy	14–10 16–10	0.51		20	
					8–2	0.76		30	

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation		
					AWG or kcmil	mm	mils
			within raceways connected to apparatus (nickel or nickel-coated copper only)		1-4/0	1.14	45
Thermoset	RHH	90°C (194°F)	Dry and damp locations			14-10 16-10 8-2 1-4/0 213-500 501-1000 1001-2000	1.14 1.52 2.03 2.41 2.79 3.18
Moisture-resistant thermoset	RHW	75°C (167°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoset	14-10 16-10 8-2 1-4/0 213-500 501-1000 1001-2000	1.14 1.52 2.03 2.41 2.79 3.18	45 60 80 95 110 125
	RHW-2	90°C (194°F)					
Silicone	SA	90°C (194°F) 200°C (392°F)	Dry and damp locations For special application ²	Silicone rubber	14-10 16-10 8-2 1-4/0 213-500 501-1000 1001-2000	1.14 1.52 2.03 2.41 2.79 3.18	45 60 80 95 110 125
Thermoset	SIS	90°C (194°F)	Switchboard and switchgear wiring only	Flame-retardant thermoset	14-10 16-10 8-2 1-4/0	0.76 1.14 1.40	30 45 55
Thermoplastic and fibrous outer braid	TBS	90°C (194°F)	Switchboard and switchgear wiring only	Thermoplastic	14-10 16-10 8 6-2 1-4/0	0.76 1.14 1.52 2.03	30 45 60 80
Extended polytetrafluoroethylene	TFE	250°C (482°F)	Dry locations only. Only for leads within apparatus or within raceways connected to	Extruded polytetrafluoroethylene	14-10 16-10 8-2	0.51 0.76	20 30

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation			
					AWG or kcmil	mm	mils	
			apparatus, or as open wiring (nickel or nickel-coated copper only)		1–4/0	1.14	45	
Heat-resistant thermoplastic	THHN	90°C (194°F)	Dry and damp locations	Flame-retardant, heat-resistant thermoplastic	14–12 <u>16–12</u>	0.38	15	
					10	0.51	20	
					8–6	0.76	30	
					4–2	1.02	40	
					1–4/0	1.27	50	
					250–500	1.52	60	
					501–1000	1.78	70	
Moisture- and heat-resistant thermoplastic	THHW	75°C (167°F)	Wet location	Flame-retardant, moisture- and heat-resistant thermoplastic	14–10 <u>16–10</u>	0.76	30	
					8	1.14	45	
					6–2	1.52	60	
		90°C (194°F)	Dry location		1–4/0	2.03	80	
					213–500	2.41	95	
					501–1000	2.79	110	
					1001–2000	3.18	125	
Moisture- and heat-resistant thermoplastic	THW	75°C (167°F)	Dry and wet locations	Flame-retardant, moisture- and heat-resistant thermoplastic	14–10 <u>16–10</u>	0.76	30	
					8	1.14	45	
					6–2	1.52	60	
		90°C (194°F)	Special applications within electric discharge lighting equipment. Limited to 1000 open-circuit volts or less. (Size 14-8 only as permitted in 410.68.)		1–4/0	2.03	80	
					213–500	2.41	95	
					501–1000	2.79	110	
					1001–2000	3.18	125	
	-	THW-2	90°C (194°F)	Dry and wet locations	-	-	-	-
	Moisture- and heat-resistant thermoplastic	THWN	75°C (167°F)	Dry and wet locations	Flame-retardant, moisture- and heat-resistant thermoplastic	14–12 <u>16–12</u>	0.38	15
						10	0.51	20
8–6						0.76	30	
4–2						1.02	40	
THWN-2		90°C (194°F)	1–4/0			1.27	50	
			250–500			1.52	60	

<u>Trade Name</u>	<u>Type Letter</u>	<u>Maximum Operating Temperature</u>	<u>Application Provisions</u>	<u>Insulation</u>	<u>Thickness of Insulation</u>		
					<u>AWG or kcmil</u>	<u>mm</u>	<u>mils</u>
					501–1000	1.78	70
Moisture-resistant thermoplastic	TW	60°C (140°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoplastic	14–10 16–10	0.76	30
					8	1.14	45
					6–2	1.52	60
					1–4/0	2.03	80
					213–500	2.41	95
					501–1000	2.79	110
					1001–2000	3.18	125
Underground feeder and branch-circuit cable — single conductor (for Type UF cable employing more than one conductor, see Article 340, Part II).	UF	60°C	See Article 340, Part II.	Moisture-resistant	14–10 16–10	1.52	60 ⁵
		(140°F)			8–2	2.03	80 ⁵
		75°C (167°F) ⁴		Moisture- and heat-resistant	1–4/0	2.41	95 ⁵
Underground service-entrance cable — single conductor (for Type USE cable employing more than one conductor, see Article 338, Part II).	USE	75°C (167°F) ⁴	See Article 338, Part II.	Heat- and moisture-resistant	14–10 16–10	1.14	45
					8–2	1.52	60
					1–4/0	2.03	80
					213–500	2.41	95 ⁶
					501–1000	2.79	110
	USE-2	90°C (194°F)	Dry and wet locations		1001–2000	3.18	125
Thermoset	XHH	90°C (194°F)	Dry and damp locations	Flame-retardant thermoset	14–10 16–10	0.76	30
					8–2	1.14	45
					1–4/0	1.40	55
					213–500	1.65	65
					501–1000	2.03	80
					1001–2000	2.41	95
Thermoset	XHHN	90°C (194°F)	Dry and damp locations	Flame-retardant thermoset	14–12 16–12	0.38	15
					10	0.51	20
					8–6	0.76	30
					4–2	1.02	40

Trade Name	Type Letter	Maximum Operating Temperature	Application Provisions	Insulation	Thickness of Insulation		
					AWG or kcmil	mm	mils
					1–4/0 250–500 501–1000	1.27 1.52 1.78	50 60 70
Moisture-resistant thermoset	XHHW	90°C (194°F)	Dry and damp locations	Flame-retardant, moisture-resistant thermoset	14–10 <u>16–10</u>	0.76	30
					8–2	1.14	45
		75°C (167°F)	Wet locations		1–4/0	1.40	55
					213–500	1.65	65
					501–1000	2.03	80
					1001–2000	2.41	95
Moisture-resistant thermoset	XHHW-2	90°C (194°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoset	14–10 <u>16–10</u>	0.76	30
					8–2	1.14	45
					1–4/0	1.40	55
					213–500	1.65	65
					501–1000	2.03	80
					1001–2000	2.41	95
Moisture-resistant thermoset	XHWN	75°C (167°F)	Dry and wet locations	Flame-retardant, moisture-resistant thermoset	14–12 <u>16–12</u>	0.38	15
					10	0.51	20
					8–6	0.76	30
	XHWN-2	90°C (194°F)			4–2	1.02	40
					1–4/0	1.27	50
					250–500	1.52	60
					501–1000	1.78	70
					Modified ethylene tetrafluoro-ethylene	Z	90°C (194°F)
	10	0.51	20				
150°C (302°F)	Dry locations — special applications ²	8–4	0.64	25			
		3–1	0.89	35			
		1/0–4/0	1.14	45			
Modified ethylene tetrafluoro-ethylene	ZW	75°C (167°F)	Wet locations	Modified ethylene tetrafluoro-ethylene	14–10 <u>16–10</u>	0.76	30
		90°C (194°F)	Dry and damp locations				
		150°C (302°F)	Dry locations — special applications ²		8–2	1.14	45
	ZW-2	90°C (194°F)	Dry and wet locations				

Note: Conductors in Table 310.4(1) shall be permitted to be rated up to 1000 volts if listed and marked.

¹Outer coverings shall not be required where listed without a covering.

²Higher temperature rated constructions shall be permitted where design conditions require maximum conductor operating temperatures above 90°C (194°F).

³Conductor sizes shall be permitted for signaling circuits permitting 300-volt insulation.

⁴The ampacity of Type UF cable shall be limited in accordance with 340.80.

⁵Type UF insulation thickness shall include the integral jacket.

⁶Insulation thickness shall be permitted to be 2.03 mm (80 mils) for listed Type USE conductors that have been subjected to special investigations. The nonmetallic covering over individual rubber-covered conductors of aluminum-sheathed cable and of lead-sheathed or multiconductor cable shall not be required to be flame retardant.

Table 310.4(2) Thickness of Insulation for Nonshielded Types RHH and RHW Solid Dielectric Insulated Conductors Rated 2000 Volts

<u>Conductor Size</u> <u>(AWG or kcmil)</u>		<u>Column A¹</u>			<u>Column B²</u>	
		<u>mm</u>	<u>mils</u>		<u>mm</u>	<u>mils</u>
14-10 16-10	-	2.03	80	-	1.52	60
8	-	2.03	80	-	1.78	70
6-2	-	2.41	95	-	1.78	70
1-2/0	-	2.79	110	-	2.29	90
3/0-4/0	-	2.79	110	-	2.29	90
213-500	-	3.18	125	-	2.67	105
501-1000	-	3.56	140	-	3.05	120
1001-2000	-	3.56	140	-	3.56	140

¹Column A insulations shall be limited to natural, SBR, and butyl rubbers.

²Column B insulations shall be materials such as cross-linked polyethylene, ethylene propylene rubber, and composites thereof.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 17:38:23 EDT 2024

Committee Statement

Committee Statement: This correlates with the conductor size changes in 310.3, applicable conductor size changes were made in this table to include an insulation thickness requirement for 16 AWG copper conductors.

Response Message: SR-8416-NFPA 70-2024

Public Comment No. 1380-NFPA 70-2024 [Section No. 310.4]



Second Revision No. 8604-NFPA 70-2024 [Section No. 310.6]

[See Attached Word Document "Revision to 310 _6" for Revision Clarification]

310 .6 Conductor Identification.

(A)– Conductors Not Exceeding 1000 Volts.

(1) _ Grounded Conductors.

Insulated or covered grounded conductors shall be identified in accordance with 200.7.

(B 2) Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119.

(C 3) Ungrounded Conductors.

(1 a)– General: _

Conductors that are intended for use as ungrounded conductors, whether used as a single conductor or in multiconductor cables, shall be finished to be clearly distinguishable from grounded conductors and equipment grounding conductors. Distinguishing markings shall not conflict in any manner with the surface markings required by 310.8(B)(1).

(2)– Branch Circuit(s): b) _

Branch-circuit ungrounded conductors supplied from more than one nominal voltage system shall be identified in accordance with 210.5(C).

(3)– Feeder(s): c) _

Feeders supplied from more than one nominal voltage system shall be identified in accordance with 215.12(C)

Exception to (a), (b), and (c) : Conductor identification shall be permitted in accordance with 200.8.

(B) Conductors Rated 1001 Volts through 2000 Volts.

(1) Grounded Conductors.

Insulated or covered grounded conductors shall be identified in accordance with 200.7.

(2) Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 270.119 .

(3) Ungrounded Conductors.

(a).

Conductors that are intended for use as ungrounded conductors, whether used as a single conductor or in multiconductor cables, shall be finished to be clearly distinguishable from grounded conductors and equipment grounding conductors. Distinguishing markings shall not conflict in any manner with the surface markings required by 310.8(B)(1) .

(b).

Branch-circuit ungrounded conductors shall be identified in accordance with 265.5(C) .

(c).

Feeders shall be identified in accordance with 266.12(C).

Exception to (a), (b), and (c): Conductor identification shall be permitted in accordance with 200.8.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_310_6.docx	Revision to 310.6	
NEC_CMP-6_SR-8604_310.6.docx	For prod use	

Submitter Information Verification

Committee: NEC-P06
Submittal Date: Tue Oct 29 09:20:46 EDT 2024

Committee Statement

Committee Statement: Section 310.6 was reorganized and split into conductors under 1001 volts and 1001 to 2000 volts since the NEC now has requirements for differing voltage ranges.
Response Message: SR-8604-NFPA 70-2024

310.6 Conductor Identification

(A) Conductors Not Exceeding 1000 Volts

(1) Grounded Conductors.

Insulated or covered grounded conductors shall be identified in accordance with **200.7**.

(2) ~~(B)~~ Equipment Grounding Conductors.

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

(3) ~~(C)~~ Ungrounded Conductors.

(a) ~~General.~~ Conductors that are intended for use as ungrounded conductors, whether used as a single conductor or in multiconductor cables, shall be finished to be clearly distinguishable from grounded conductors and equipment grounding conductors. Distinguishing markings shall not conflict in any manner with the surface markings required by **310.8(B)(1)**.

(b) ~~Branch Circuit(s).~~ Branch-circuit ungrounded conductors shall be identified in accordance with **210.5(C)**.

(c) ~~Feeder(s).~~ Feeders shall be identified in accordance with **215.12(C)**

Exception to (a), (b), and (c): Conductor identification shall be permitted in accordance with 200.8.

(B) Conductors Rated 1001 Volts through 2000 Volts

(1) Grounded Conductors.

Insulated or covered grounded conductors shall be identified in accordance with **200.7**.

(2) Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with **270.119**.

(3) Ungrounded Conductors.

(a) Conductors that are intended for use as ungrounded conductors, whether used as a single conductor or in multiconductor cables, shall be finished to be clearly distinguishable from grounded conductors and equipment grounding conductors. Distinguishing markings shall not conflict in any manner with the surface markings required by **310.8(B)(1)**.

(b) Branch-circuit ungrounded conductors shall be identified in accordance with **265.5(C)**.

(c) Feeders shall be identified in accordance with **266.12(C)**

Exception to (a), (b), and (c): Conductor identification shall be permitted in accordance with 200.8.



Second Revision No. 8420-NFPA 70-2024 [Section No. 310.10(D)]

(D) Conductors Exposed to Direct Sunlight.

Conductors exposed to the rays of the sun shall comply with one of the following:

- (1) Be insulated and listed as being sunlight resistant
- (2) Be covered with insulating material, such as tape or sleeving, that is listed as being sunlight resistant
- (3) Be bare or have insulation or covering that is not required to be sunlight resistant where bare conductors are permitted elsewhere in this code

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 17:58:04 EDT 2024

Committee Statement

Committee Statement: This editorial revision provides clarity that any insulation or covering present, either with or without sunlight resistance, is permitted where the conductors would normally be permitted to be bare.

Response Message: SR-8420-NFPA 70-2024

Public Comment No. 1386-NFPA 70-2024 [Section No. 310.10(D)]



Second Revision No. 8473-NFPA 70-2024 [Section No. 310.12(D)]

(D) Grounded Conductors.

Grounded conductors shall be permitted to be sized smaller than the ungrounded conductors, if the requirements of 120.61 and 230.42 for service conductors or the requirements of 215.4 and 120.61 for feeder conductors are met.

~~Where correction or adjustment factors are required by 310.15(B) or 310.15(C), they shall be permitted to be applied to the ampacity associated with the temperature rating of the conductor.~~

Informational Note No. 1: See 240.6(A) for standard ampere ratings for fuses and inverse time circuit breakers.

Informational Note No. 2: See Informative Annex D, Example D7.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 21:21:41 EDT 2024

Committee Statement

Committee Statement: The language was relocated from 310.12(D) to 310.12 during the first draft cycle so it would be applicable to all sections of 310.12 and should have been removed from 310.12(D).

Response Message: SR-8473-NFPA 70-2024

[Public Comment No. 1001-NFPA 70-2024 \[Section No. 310.12\(D\)\]](#)



Second Revision No. 8433-NFPA 70-2024 [Section No. 310.14(A)(3)]

(3) Temperature Limitation of Conductors.

No conductor shall be used in such a manner that its operating temperature exceeds that designated for the type of insulated conductor involved. In no case shall conductors be associated together in such a way, with respect to type of circuit, the wiring method employed, or the number of conductors, that the limiting temperature of any conductor is exceeded.

Informational Note No. 1: See Table 310.4(1)- ~~and Table 315.10(A)~~ - for the temperature rating of a conductor that is the maximum temperature, at any location along its length, that the conductor can withstand over a prolonged time period without serious degradation. The ampacity tables of ~~Article 310~~ - this article and the ampacity tables of Informative Annex B, the ambient temperature correction factors in 310.15(B), and the notes to the tables provide guidance for coordinating conductor sizes, types, ampacities, ambient temperatures, and number of associated conductors. The principal determinants of operating temperature are as follows:

- (1) Ambient temperature — ambient temperature may vary along the conductor length as well as from time to time.
- (2) Heat generated internally in the conductor as the result of load current flow, including fundamental and harmonic currents.
- (3) The rate at which generated heat dissipates into the ambient medium. Thermal insulation that covers or surrounds conductors affects the rate of heat dissipation.
- (4) Adjacent load-carrying conductors — adjacent conductors have the dual effect of raising the ambient temperature and impeding heat dissipation.

Informational Note No. 2: Refer to 110.14(C) for the temperature limitation of terminations.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 18:30:49 EDT 2024

Committee Statement

Committee Statement: A second revision was created to delete “Article 310” and replace it with “this article”. This action was taken to comply with the NEC Style Manual Section 4.1.4. The reference to Table 315.10(A) was removed because conductors over 2000 volts were put into a separate article.

Response Message: SR-8433-NFPA 70-2024

[Public Comment No. 559-NFPA 70-2024 \[Section No. 310.14\(A\)\(3\)\]](#)



Second Revision No. 8440-NFPA 70-2024 [Section No. 310.15(E)]

(E) Neutral Conductor.

When applying 310.15(C), neutrals shall comply with 310.15(A)(1) or 310.15(B)(2).

(1) Current-Carrying.

A neutral conductor shall be considered as current-carrying in any of the following circuits:

- (1) A 2 wire circuit consisting of one ungrounded and one neutral conductor
- (2) A 3 wire circuit consisting of two ungrounded conductors and the neutral conductor of a 4-wire, 3 phase, wye connected system

Informational Note: When two ungrounded conductors and a neutral originate from a 4-wire, 3 phase, wye connected system, the neutral conductor carries approximately the same current as the line-to-neutral load current of the other conductors.

- (3) A 4-wire, 3-phase wye circuit where the major portion of the load consists of nonlinear loads

Informational Note: Where the major portion of the loads consists of nonlinear loads in a 4-wire, 3 phase wye circuit, harmonic currents are present in the neutral conductor.

(2) Non-Current-Carrying.

~~A~~ For circuits not covered in 310.15(E)(1), a neutral conductor that carries only the unbalanced current from the other conductors of the same circuit shall not be considered current-carrying.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 18:43:20 EDT 2024

Committee Statement

Committee Statement: A second revision was created to correct the misnumbered references to 310.15(E)(1) and 310.15(E)(2). Editorial revisions were also made to 310.15(E)(2) to provide distinction between current-carrying and non-current-carrying neutral conductors.

Response Message: SR-8440-NFPA 70-2024

Public Comment No. 731-NFPA 70-2024 [Section No. 310.15(E)]



Committee Comment No. 8481-NFPA 70-2024 [Section No. 310.16]

310.16 Ampacities of Insulated Conductors in Raceway, Cable, or Earth (Directly Buried).

The ampacities shall be as specified in Table 310.16 where all of the following conditions apply:

- (1) Conductors are rated 0 volts through 2000 volts.
- (2) Conductors are rated 60°C (140°F), 75°C (167°F), or 90°C (194°F).
- (3) Wiring is installed in a 30°C (86°F) ambient temperature.
- (4) There are not more than three current-carrying conductors.

Table 310.16 Ampacities of Insulated Conductors with Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth (Directly Buried)

<u>Size AWG or kcmil</u>	<u>Temperature Rating of Conductor [See Table 310.4(1)]</u>						<u>Size AWG or kcmil</u>
	<u>60°C (140°F)</u>	<u>75°C (167°F)</u>	<u>90°C (194°F)</u>	<u>60°C (140°F)</u>	<u>75°C (167°F)</u>	<u>90°C (194°F)</u>	
	<u>Types TW, UF</u>	<u>Types RHW, THHW, THW, THWN, XHHW, XHWN, USE, ZW</u>	<u>Types TBS, SA, SIS, FEP, FEPB, MI, PFA, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE- 2, XHH, XHHW, XHHW-2, XHWN-2, XHHN, Z, ZW-2</u>	<u>Types TW, UF</u>	<u>Types RHW, THHW, THW, THWN, XHHW, XHWN, USE</u>	<u>Types TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, XHWN-2, XHHN</u>	
	<u>COPPER</u>			<u>ALUMINUM OR COPPER-CLAD ALUMINUM</u>			
18 ^{± a}	—	—	14	—	—	—	—
16 ^{± a}	10 [—]	15 ^c 18	20 ^c	—	—	—	—
14 ^{± a}	15	20	25	10 ^{† bc}	15 ^{bc}	20 ^{bc}	14 ^{† a}
12 ^{± a}	20	25	30	15	20	25	12 ^{± a}
10 ^{± a}	30	35	40	25	30	35	10 ^{± a}
8	40	50	55	35	40	45	8
6	55	65	75	40	50	55	6
4	70	85	95	55	65	75	4
3	85	100	115	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	145	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	195	230	260	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	350	420	475	285	340	385	600
700	385	460	520	315	375	425	700
750	400	475	535	320	385	435	750

800	410	490	555	330	395	445	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	525	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	555	665	750	470	560	630	2000

Notes:

1. Section 310.15(B) shall be referenced for ampacity correction factors where the ambient temperature is other than 30°C (86°F).
2. Section 310.15(C)(1) shall be referenced for more than three current-carrying conductors.
3. Section 310.16 shall be referenced for conditions of use.

^a Section 240.4(D) shall be referenced for conductor overcurrent protection limitations, except as modified elsewhere in the code.

^b Ampacity shall be applicable only to copper-clad aluminum conductors.

^c Ampacity shall be used for adjustment or correction only.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 00:58:05 EDT 2024

Committee Statement

Committee Statement: The NEC now allows conductor sizes of 16 AWG copper and 14 AWG copper-clad aluminum; therefore values were added to the ampacity table for making ampacity adjustments and corrections.

Response Message: CC-8481-NFPA 70-2024

Public Comment No. 238-NFPA 70-2024 [Section No. 310.16]



Second Revision No. 8470-NFPA 70-2024 [Section No. 320.2]

[See Attached Word Document "Revision to 320.2" For Revision Clarification]

320.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type AC cable
- (2) ~~Support and securement hardware~~
Fittings
- (3) Cable ties, staples, and hangers
- (4) Type AC cable fittings used for connecting ~~Type AC~~ cable to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_320_2.docx	Revision to 320.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 20:34:38 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items already specified in .30. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago. Other approved means are permitted by the AHJ in the .30 section for securing and supporting.

Response Message: SR-8470-NFPA 70-2024

[Public Comment No. 1161-NFPA 70-2024 \[Section No. 320.2\]](#)

[Public Comment No. 1265-NFPA 70-2024 \[Section No. 320.2\]](#)

320.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type AC cable
- (2) Cable ties, staples, straps, and hangers~~Support and securement hardware~~
- (3) Type AC cable ~~Fittings-fittings~~ used for connecting ~~Type AC~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8519-NFPA 70-2024 [Section No. 320.15]

320.15 Exposed Work.

Exposed runs of cable, except as provided in 300.13(B), shall closely follow the surface of the building finish or of running boards. Exposed runs shall also be permitted ~~to be installed~~ on the underside of joists where supported at each joist and located so as not to be subject to physical damage.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 13:53:55 EDT 2024

Committee Statement

Committee Statement: Based on global PC 649 the text “to be installed” is redundant and has been removed to increase clarity.

Response Message: SR-8519-NFPA 70-2024



Second Revision No. 8520-NFPA 70-2024 [Section No. 322.30]

322.30 Securing and Supporting.

The flat cable assemblies shall be supported by means of their special design features, within the surface metal raceways.

The surface metal raceways shall be supported as required for the specific raceway- ~~to be installed~~ .

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 13:56:58 EDT 2024

Committee Statement

Committee Statement: Based on PC 649 the text "to be installed" is redundant and has been removed to increase clarity.

Response Message: SR-8520-NFPA 70-2024



Second Revision No. 8586-NFPA 70-2024 [Section No. 324.42(A)]

(A) Receptacles.

All receptacles, receptacle housings, and self-contained wiring devices used with the FCC system shall be identified for this use and shall be connected to the Type FCC cable and metal shields. Connection from any equipment grounding conductor of the Type FCC cable shall be made to the shield system at each receptacle.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 14:00:35 EDT 2024

Committee Statement

Committee Statement: Revised to align with the new definition for "wiring device."

Response Message: SR-8586-NFPA 70-2024



Second Revision No. 8523-NFPA 70-2024 [Section No. 324.42(B)]

(B) Receptacles and Housings.

Receptacle housings and self-contained wiring devices designed either for floor mounting or for in-wall or on-wall mounting shall be permitted for use with the FCC system. Receptacle housings and self-contained wiring devices shall incorporate means for facilitating entry and termination of Type FCC cable and for electrically connecting the housing or wiring device with the metal shield. Receptacles and self-contained wiring devices shall comply with 406.12. Power and communications outlets installed together in common housing shall be permitted in accordance with ~~800~~ 722.133(A)(3), Exception No. 2.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 14:00:48 EDT 2024

Committee Statement

Committee Statement: Based on global 542 we updated to reference the relocated requirement. Revised to align with the new definition for "wiring device."

Response Message: SR-8523-NFPA 70-2024



Second Revision No. 8577-NFPA 70-2024 [Section No. 324.60]

324.60 Grounding and Bonding.

All metal shields, boxes, receptacle housings, and self-contained wiring devices shall be electrically continuous to the equipment grounding conductor of the supplying branch circuit. All such electrical connections shall be made with connectors identified for this use. The electrical resistivity of such shield system shall not be more than that of one conductor of the Type FCC cable used in the installation.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 12:25:01 EDT 2024

Committee Statement

Committee Statement: Added "wiring" to align with the new definition of wiring devices from CMP 18.

Response Message: SR-8577-NFPA 70-2024



Second Revision No. 8474-NFPA 70-2024 [Section No. 330.2]

[See Attached Word Document "Revision to 330.2" For Revision Clarification]

330.2 Listing Requirements.

The following items shall be listed and identified for such use:

- (1) Type MC cable
- (2) ~~Support and securement hardware~~
Fittings
- (3) Cable ties, cable cleats, staples, straps, and hangers
- (4) Type MC cable fittings used for connecting ~~Type MC~~ cable to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_330_2.docx	Revision to 330.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 23:37:05 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items already specified in .30. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago. Other approved means are permitted by the AHJ in the .30 section for securing and supporting.

Response Message: SR-8474-NFPA 70-2024

Public Comment No. 1163-NFPA 70-2024 [Section No. 330.2]

Public Comment No. 1603-NFPA 70-2024 [Section No. 330.2]

330.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type MC cable
- (2) ~~Cable ties, staples, straps, and hangers~~ Support and securement hardware
- (3) ~~Type MC cable Fittings-fittings~~ used for connecting ~~Type MC~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8535-NFPA 70-2024 [Section No. 330.10(A)]

[See Attached Word Document "Revision to 330_10A" For Revision Clarification]

(A) General Uses.

Type MC cable shall be permitted as follows:

- (1) For services, feeders, and branch circuits.
- (2) For power, lighting, control, and signal circuits.
- (3) Indoors or outdoors.
- (4) Exposed or concealed.
- (5) To be direct buried where identified for such use.
- (6) In cable tray where identified for such use.
- (7) In any raceway.
- (8) As aerial cable on a messenger.
- (9) In hazardous (classified) locations where specifically permitted by other articles in this code.
- (10) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations.
- (11) In damp or wet locations where a jacket is provided over the metallic covering and any of the following conditions are met:
 - (12) The metallic covering is impervious to moisture.
 - (13) A moisture-impervious jacket is provided under the metal covering.
 - (14) The insulated conductors under the metallic covering are listed for use in wet locations.

Exception to (11): MC cable with copper armor that is impervious to moisture shall not be required to have a jacket.

- (1) Where single-conductor cables are used, all phase conductors and, where used, the grounded conductor shall be grouped together to minimize induced voltage on the sheath.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_330_10A.docx	Revision to 330_10A	
Revision_to_330_10A_SR-8535_CMP-6.docx	For prod use	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 14:31:26 EDT 2024

Committee Statement

Committee Statement: Language was added back into the charging sentence of (11) to make sure that the metallic armor is protected from deterioration in damp and wet locations. An exception was added for copper-alloy covered cable because its construction is already impervious to moisture and resistant to corrosion.

Response Message: SR-8535-NFPA 70-2024

Public Comment No. 1255-NFPA 70-2024 [Section No. 330.10(A)]

330.10 Uses Permitted.

(A) General Uses.

Type MC cable shall be permitted as follows:

- (1) For services, feeders, and branch circuits.
- (2) For power, lighting, control, and signal circuits.
- (3) Indoors or outdoors.
- (4) Exposed or concealed.
- (5) To be direct buried where identified for such use.
- (6) In cable tray where identified for such use.
- (7) In any raceway.
- (8) As aerial cable on a messenger.
- (9) In hazardous (classified) locations where specifically permitted by other articles in this code.
- (10) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations.
- (11) In damp or wet locations where a jacket is provided over the metallic covering and any of the following conditions are met:
 - a. The metallic covering is impervious to moisture.
 - b. A moisture-impervious jacket is provided under the metal covering.
 - c. The insulated conductors under the metallic covering are listed for use in wet locations.

Exception to (11): MC cable with a copper-alloy armor that is impervious to moisture shall not be required to have a jacket.

- (12) Where single-conductor cables are used, all phase conductors and, where used, the grounded conductor shall be grouped together to minimize induced voltage on the sheath.



Second Revision No. 8544-NFPA 70-2024 [Section No. 330.10(B) [Excluding any Sub-Sections]]

Type MC cable shall be permitted ~~to be installed~~ in compliance with Article 725, Parts II and III and 770.133 as applicable and in accordance with 330.10(B)(1) through 330.10(B)(4).

Informational Note: The “Uses Permitted” is not an all-inclusive list.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 16:17:19 EDT 2024

Committee Statement

Committee Statement: Based on global 649, the text “to be installed” is redundant and has been removed to increase clarity.

Response Message: SR-8544-NFPA 70-2024



Second Revision No. 8546-NFPA 70-2024 [Section No. 330.15]

330.15 Exposed Work.

Exposed runs of cable, except as provided in 300.13(B), shall closely follow the surface of the building finish or of running boards. Exposed runs shall also be permitted ~~to be installed~~ on the underside of joists where supported at each joist and located so as not to be subject to physical damage.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 16:20:24 EDT 2024

Committee Statement

Committee Statement: Based on global 649, the text “to be installed” is redundant and has been removed to increase clarity.

Response Message: SR-8546-NFPA 70-2024



Second Revision No. 8548-NFPA 70-2024 [Section No. 330.30(A)]

(A) General.

Type MC cable shall be supported and secured by ~~cable~~ one of the following:

- 1) Cable ties listed and identified for securement and support; ~~listed~~
- 2) Listed staples, cable cleats, straps, hangers, or similar fittings; ~~or other~~
- 3) Other approved means designed and installed so as not to damage the cable.

Type MC cable fittings and connectors shall be permitted as a means of cable support.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-6_SR-8548_330.30_A_.docx		

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 16:29:46 EDT 2024

Committee Statement

Committee Statement: Section was modified to a list to make it easier to follow.

Response Message: SR-8548-NFPA 70-2024

(A) General.

Type MC cable shall be supported and secured ~~by cable ties listed and identified for securement and support; listed staples, straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable; one of the following:~~

(1) Cable ties listed and identified for securement and support

(2) Listed staples, cable cleats, straps, hangers, or similar fittings

(3) Other approved means designed and installed so as not to damage the cable

Type MC cable fittings and connectors shall be permitted as a means of cable support.



Second Revision No. 8475-NFPA 70-2024 [Section No. 332.2]

[See Attached Word Document "Revision to 332. 2" For Revision Clarification]

332. 2 Listing Requirements.

The following items shall be listed and identified for such use:

- (1) Type MI cable
- (2) ~~Support Straps and securement hardware~~
Fittings
- (3) hangers
- (4) Type MI cable fittings used for connecting ~~Type MI~~ cables to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_332_2.docx	Revision to 332.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 23:50:55 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items already specified in .30. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago. Other approved means are permitted by the AHJ in the .30 section for securing and supporting.

Response Message: SR-8475-NFPA 70-2024

Public Comment No. 1166-NFPA 70-2024 [Section No. 332.2]

332.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type MI cable
- (2) ~~Staples and hangers~~Support and securement hardware
- (3) ~~Type MI cable~~ ~~Fittings-fittings~~ used for connecting ~~Type MI~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8476-NFPA 70-2024 [Section No. 334.2]

[See Attached Word Document "Revision to 334.2" For Revision Clarification]

334.2 Listing Requirements.

The following items shall be listed and identified for such use:

- (1) Type NM and Type NMC cables
- (2) ~~Support and securement hardware~~
~~Fittings used for connecting~~
- (3) Cable ties, staples, straps, and hangers
- (4) Type NM and Type NMC fittings used for connecting cables to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_334_2.docx	Revision to 334.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Thu Oct 24 23:58:34 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items already specified in .30. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago. Other approved means are permitted by the AHJ in the .30 section for securing and supporting.

Response Message: SR-8476-NFPA 70-2024

Public Comment No. 1167-NFPA 70-2024 [Section No. 334.2]

Public Comment No. 1605-NFPA 70-2024 [Section No. 334.2]

334.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type NM and Type NMC cable
- (2) Cable ties, staples, straps, and hangers ~~Support and securement hardware~~
- (3) Type NM and Type NMC cable Fittings-fittings used for connecting ~~Type NM and Type NMC~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8551-NFPA 70-2024 [Section No. 334.10 [Excluding any Sub-Sections]]

Type NM and Type NMC cables shall be permitted to be used in the following, except as prohibited in 334.12:

- (1) One- and two-family dwellings and their attached or detached garages, and their storage buildings.
- (2) Multi-family dwellings and their detached garages permitted to be of Types III, IV, and V construction.
- (3) Other structures permitted to be of Types III, IV, and V construction. Cables shall be ~~concealed~~ installed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

Informational Note No. 1: See NFPA 220-2024, *Standard on Types of Building Construction*, or the applicable building code, or both for types of building construction and occupancy classification definitions.

Informational Note No. 2: See Informative Annex E for determination of building types.

- (4) Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.

Informational Note No. 3: See 310.14(A)(3) for temperature limitation of conductors.

- (5) Types I and II construction where installed within raceways permitted ~~to be installed~~ in Types I and II construction.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 17:24:33 EDT 2024

Committee Statement

Committee Statement: NM Cables installed behind items such as fire-rated access panels are considered as exposed rather than concealed per the Article 100 definition of Exposed (as applied to wiring methods). Based on global 649, the text “to be installed” is redundant and has been removed to increase clarity.

Response Message: SR-8551-NFPA 70-2024

[Public Comment No. 295-NFPA 70-2024 \[Section No. 334.10 \[Excluding any Sub-Sections\]\]](#)



Second Revision No. 8554-NFPA 70-2024 [Section No. 334.19]

334.19 Cable Entries.

The sheath on nonmetallic-sheathed cable shall extend not less than 6 mm (¼ in.) ~~and not greater than 25.4 mm (1 in.)~~ beyond any cable clamp or cable entry in inside the enclosure, outlet, device, pull, or junction box .

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 17:29:52 EDT 2024

Committee Statement

Committee Statement: The 1 inch limitation was removed to address the concerns of the submitter that attempting to remove excess sheath could result in damaging the conductors. The requirement in 300.14 to start the 6" measurement of free conductor at the point of emergence from the sheath will tend to limit the amount of sheath that is left in the box, if enforced. The following text "inside the enclosure, outlet, device, pull, or junction box" was added to provide inspectors enforceable text for making sure the end of the sheath properly extends into the enclosure, outlet, device, pull, or junction box.

Response Message: SR-8554-NFPA 70-2024

Public Comment No. 256-NFPA 70-2024 [Section No. 334.19]



Second Revision No. 8578-NFPA 70-2024 [Section No. 334.40(C)]

(C)– Wiring Devices with Integral Enclosures.

Wiring devices with integral enclosures identified for such use shall be permitted as provided by 300.17(E).

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 12:33:09 EDT 2024

Committee Statement

Committee Statement: Added "wiring" to align with the new definition of wiring devices from CMP 18.

Response Message: SR-8578-NFPA 70-2024



Second Revision No. 8565-NFPA 70-2024 [Section No. 334.104]

334.104 Conductors.

The 600-volt insulated power conductors shall be sizes ~~14 AWG~~ 16 AWG through 2 AWG copper conductors or sizes ~~12 AWG~~ 14 AWG through 2 AWG ~~aluminum or copper-clad aluminum~~ or 12 AWG through 2 AWG aluminum conductors.- ~~Control~~

For control and signaling conductors, minimum conductors sizes shall be ~~no smaller~~ not less than 18 AWG copper and 16 AWG copper-clad aluminum .

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-6_SR-8565_334.104.docx		

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 03:25:05 EDT 2024

Committee Statement

Committee Statement: Based on the data provided 14 AWG copper-clad aluminum is added as a smaller sized branch circuit conductor for NM cable. 16 AWG copper is added as a branch circuit conductor based on its historical use. 16 AWG copper-clad aluminum is being added as a smaller remote control and signal wire for use in NM cable.

Response Message: SR-8565-NFPA 70-2024

Public Comment No. 240-NFPA 70-2024 [Section No. 334.104]

334.104 Conductors.

The 600-volt insulated power conductors shall be sizes ~~16 AWG through 2 AWG copper conductors~~ ~~or sizes~~ 14 AWG through 2 AWG copper-clad aluminum conductors or ~~sizes~~ 12 AWG through 2 AWG aluminum ~~or copper-clad aluminum~~ conductors. ~~Control~~ For control and signaling conductors, ~~minimum conductors sizes~~ shall be ~~no smaller~~ not less than 18 AWG copper and 16 AWG copper-clad aluminum.

Commented [SB1]: Move this as 2nd para



Second Revision No. 8477-NFPA 70-2024 [Section No. 336.2]

[See Attached Word Document "Revision to 336.2" For Revision Clarification]

336.2 Listing Requirements.

The following items shall be listed and identified for such use:

- (1) Type TC cables
- (2) ~~Support and securement hardware~~
Fittings
- (3) Cable ties, cable cleats, staples, straps, and hangers
- (4) Type TC cable fittings used for connecting ~~Type TC~~ cable to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_336_2.docx	Revision to 336.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 00:07:52 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago.

Response Message: SR-8477-NFPA 70-2024

Public Comment No. 1170-NFPA 70-2024 [Section No. 336.2]

336.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type TC cable
- (2) ~~Cable ties, cable cleats, staples, straps, and hangers~~ Support and securement hardware
- (3) ~~Type TC cable~~ ~~Fittings-fittings~~ used for connecting ~~Type TC~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8559-NFPA 70-2024 [Section No. 336.10]

[See Attached Word Document "Revision to 336 _10" For Revision Clarification]

336 .10 Uses Permitted.

Type TC cable shall be permitted to be used as follows:

- (1) For power, lighting, control, and signal circuits.
- (2) In cable trays, including those with mechanically discontinuous segments up to 300 mm (1 ft).
- (3) In raceways.
- (4) In outdoor locations supported by a messenger wire.
- (5) For Class 1 circuits installed in accordance with 300.28.
- (6) For non-power-limited fire alarm circuits if conductors comply with the requirements of 760.49.
- (7) Between a cable tray, raceway, or enclosure and the utilization equipment or device(s), provided all of the following apply:
 - (8) The cable is Type TC-ER and is surface marked "TC-ER."
 - (9) The cable is installed in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation.
 - (10) The cable is continuously supported and protected against physical damage using mechanical protection such as struts, angles, or channels.
 - (11) The cable is secured at intervals not exceeding 1.8 m (6 ft).
 - (12) Equipment grounding for the utilization equipment is provided by an equipment grounding conductor within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119 .

Exception to (7): Where not subject to physical damage, Type TC-ER shall be permitted to transition

~~between cable trays and between cable trays and equipment or devices for~~

a.

a distance not to exceed 1.

~~8 m~~

a.

8 m (

~~6 ft~~

a.

6 ft) without continuous support

~~The cable~~

a.

between a cable tray and the following:

1) cable tray

2) raceway

3) enclosure

4) equipment

Any cable transition shall be mechanically supported

~~where exiting the cable tray~~

a.

to ensure that the minimum bending radius is not exceeded.

(13) Type TC cable shall be resistant to moisture and corrosive agents where installed in wet locations.

(14) For one- and two-family dwelling units, Type TC-ER-JP cable containing conductors for both power and control circuits shall be permitted for branch circuits and feeders. Type TC-ER-JP cable used as interior wiring shall be installed per the requirements of Article 334, Part II and where installed as exterior wiring shall be installed per the requirements of Article 340, Part II.

Exception: Where used to connect a generator and associated equipment having terminals rated 75°C (140°F) or higher, the cable shall not be limited in ampacity by 334.80 or 340.80.

Informational Note No. 1: See ~~725~~ 722 .~~436~~ 13 for limitations on Class 2 or 3 circuits contained within the same cable with conductors of electric light, power, or Class 1 circuits.

(15) Direct buried, where identified for such use.

(16) In hazardous (classified) locations where specifically permitted by other articles in this code.

(17) For service-entrance conductors where identified for such use and marked Type TC-ER.

Informational Note No. 2: See 310.14(A)(3) for temperature limitation of conductors.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_336_10.docx	Revision to 336.10	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 19:02:41 EDT 2024

Committee Statement

Committee Statement: Updated to align with the charging text in section 336.10(7). The revision clarifies where Type TC-ER cable can be run unsupported. Updated cross reference in (9) per CC requests.

Response Message: SR-8559-NFPA 70-2024

Public Comment No. 1846-NFPA 70-2024 [Section No. 336.10]

336.10 Uses Permitted.

Type TC cable shall be permitted to be used as follows:

- (1) For power, lighting, control, and signal circuits.
- (2) In cable trays, including those with mechanically discontinuous segments up to 300 mm (1 ft).
- (3) In raceways.
- (4) In outdoor locations supported by a messenger wire.
- (5) For Class 1 circuits installed in accordance with 300.28.
- (6) For non-power-limited fire alarm circuits if conductors comply with the requirements of 760.49.
- (7) Between a cable tray, raceway, or enclosure and the utilization equipment or device(s), provided all of the following apply:
 - a. The cable is Type TC-ER and is surface marked "TC-ER."
 - b. The cable is installed in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation.
 - c. The cable is continuously supported and protected against physical damage using mechanical protection such as struts, angles, or channels.
 - d. The cable is secured at intervals not exceeding 1.8 m (6 ft).
 - e. Equipment grounding for the utilization equipment is provided by an equipment grounding conductor within the cable. In cables containing conductors sized 6 AWG or smaller, the equipment grounding conductor shall be provided within the cable or, at the time of installation, one or more insulated conductors shall be permanently identified as an equipment grounding conductor in accordance with 250.119.

Exception to (7): Where not subject to physical damage, Type TC-ER shall be permitted to transition a distance not to exceed 1.8 m (6 ft) without continuous support between a cable trays and the following:

1) cable tray

2) raceway

3) enclosure

4) equipment; or and between cable trays and, raceways, or enclosures, and equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support.

The Any cable transition shall be mechanically supported where exiting the cable tray, raceway, or enclosure to ensure that the minimum bending radius is not exceeded.

(8) Type TC cable shall be resistant to moisture and corrosive agents where installed in wet locations.

(9) For one- and two-family dwelling units, Type TC-ER-JP cable containing conductors for both power and control circuits shall be permitted for branch circuits and feeders. Type TC-ER-JP cable used as interior wiring shall be installed per the requirements of Article 334, Part II and where installed as exterior wiring shall be installed per the requirements of Article 340, Part II.

Exception: Where used to connect a generator and associated equipment having terminals rated 75°C (140°F) or higher, the cable shall not be limited in ampacity by 334.80 or 340.80.

Informational Note No. 1: See ~~725.136~~[722.13](#) for limitations on Class 2 or 3 circuits contained within the same cable with conductors of electric light, power, or Class 1 circuits.

(10) Direct buried, where identified for such use.

(11) In hazardous (classified) locations where specifically permitted by other articles in this code.

(12) For service-entrance conductors where identified for such use and marked Type TC-ER.

Informational Note No. 2: See 310.14(A)(3) for temperature limitation of conductors.



Second Revision No. 8502-NFPA 70-2024 [New Section after 336.24]

336.30 Securing and Supporting.

Type TC cable shall be supported and secured by one of the following means:

- (1) Cable ties listed and identified for securement and support
- (2) Listed staples, cable cleats, straps, hangers, or similar fittings
- (3) Other approved means designed and installed so as not to damage the cable

Type TC cable fittings and connectors shall be permitted as a means of cable support.

-

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 11:45:04 EDT 2024

Committee Statement

Committee Statement: Section 336.30 was added to allow for other approved means of securing and support that may not be listed but approved by the AHJ. This also aligns with other cable articles.

Response Message: SR-8502-NFPA 70-2024



Second Revision No. 8587-NFPA 70-2024 [Section No. 336.126]

336.126 Hazardous (Classified) Location Cable.

Cable listed and marked Type TC-ER-HL shall comply with the following:

- (1) The overall nonmetallic jacket shall be suitable for the environment.
- (2) The overall cable construction shall be essentially circular in cross-section.
- (3) The overall nonmetallic jacket shall be continuous and gas/vapor tight.
- (4) ~~For construction greater than 25.4 mm (1 in.) in diameter, the following shall apply:~~
- (5) ~~The equipment grounding conductor shall be bare.~~
- (6) ~~A metallic shield shall be included over all conductors under the outer jacket.~~

Informational Note: See ANSI/UL 2225-2022, *Cables and Cable Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 14:07:07 EDT 2024

Committee Statement

Committee Statement: List item (4) was removed to address the concerns of the submitter. The product standard contains many different constructions with power and control conductors, and a size or ampacity threshold is more appropriately covered in the product standard.

Response Message: SR-8587-NFPA 70-2024

Public Comment No. 1411-NFPA 70-2024 [Section No. 336.126]



Second Revision No. 8478-NFPA 70-2024 [Section No. 337.2]

[See Attached Word Document "Revision to . 337. 2" For Revision Clarification]

337. 2 Listing Requirements.

The following items shall be listed and identified for such use:

- (1) Type P cables
- (2) ~~Support and securement hardware~~
Fittings
- (3) Cable ties, straps, and hangers
- (4) Type P cable fittings used for connecting ~~Type P~~ cable to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_337_2.docx	Revision to 337.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 00:14:59 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items already specified in .30. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago. Other approved means are permitted by the AHJ in the .30 section for securing and supporting.

Response Message: SR-8478-NFPA 70-2024

Public Comment No. 1171-NFPA 70-2024 [Section No. 337.2]

337.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type P cable
- (2) Cable ties, straps, and hangers~~Support and securement hardware~~
- (3) Type P cable~~Fittings-fittings~~ used for connecting ~~Type P~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8507-NFPA 70-2024 [Section No. 337.30]

337.30 Securing and Supporting.

Type P cable shall be supported and secured by ~~cable~~ one of the following:

- 1) Cable ties listed and identified for securement and support;
- 2) Listed straps, hangers, or similar fittings; ~~or other~~
- 3) Other approved means designed and installed so as not to damage the cable.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-6_SR-8507_337.30.docx		

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 12:00:22 EDT 2024

Committee Statement

Committee Statement: Section was modified to a list to make it easier to follow.

Response Message: SR-8507-NFPA 70-2024

337.30 Securing and Supporting.

Type P cable shall be supported and secured by ~~cable ties listed and identified for securement and support; straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable;~~one of the following:

- (1) Cable ties listed and identified for securement and support
- (2) Listed straps, hangers, or similar fittings
- (3) Other approved means designed and installed so as not to damage the cable



Second Revision No. 8479-NFPA 70-2024 [Section No. 338.2]

[See Attached Word Document "Revision to _ 338. 2" For Revision Clarification]

338. 2 Listing Requirements.

The following items shall be listed and identified for such use:

- (1) Type SE and Type USE cables
- (2) ~~Support and securement hardware~~
~~Fittings used for connecting~~
- (3) Cable ties, staples, straps, and hangers
- (4) Type SE and Type USE cable fittings used for connecting cable to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_338_2.docx	Revision to 338.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 00:23:42 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific items. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago.

Response Message: SR-8479-NFPA 70-2024

Public Comment No. 1172-NFPA 70-2024 [Section No. 338.2]

338.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type SE and Type USE cable
- (2) ~~Cable ties, staples, straps, and hangers~~ Support and securement hardware
- (3) ~~Type SE and Type USE cable~~ Fittings-fittings used for connecting ~~Type SE and Type USE~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8480-NFPA 70-2024 [Section No. 340.2]

[See Attached Word Document "Revision to _ 340. 2" For Revision Clarification]

340. 2 Listing Requirements.

The following items shall be ~~listed and~~ listed and identified for such use:

- (1) Type UF cable
- (2) ~~Support and securement hardware~~
Fittings
- (3) Cable ties, staples, straps, and hangers
- (4) Type UF cable fittings used for connecting ~~Type UF~~ cable to boxes, cabinets, or other equipment

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Revision_to_340_2.docx	Revision to 340.2	

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 00:30:05 EDT 2024

Committee Statement

Committee Statement: To address the submitter's concerns, the panel replaced the general terminology with the specific. To avoid damage to cable and undue stress on electrical connections, the use of listed hardware for support and securement of cable is necessary. UL 2239, the Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, was first published nearly 20 years ago.

Response Message: SR-8480-NFPA 70-2024

Public Comment No. 1174-NFPA 70-2024 [Section No. 340.2]

340.2 Listing Requirements.

The following shall be listed and identified:

- (1) Type UF cable
- (2) ~~Cable ties, staples, straps, and hangers~~ Support and securement hardware
- (3) ~~Type UF cable~~ Fittings-fittings used for connecting ~~Type UF~~ cable to boxes, cabinets, or other equipment



Second Revision No. 8563-NFPA 70-2024 [Section No. 340.104]

340.104 Conductors.

The conductors shall be sizes ~~14 AWG~~ 16 AWG through 4/0 AWG copper ~~or~~ , 14 AWG through 4/0 AWG copper-clad aluminum, or 12 AWG through 4/0 AWG aluminum.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 20:39:54 EDT 2024

Committee Statement

Committee Statement: The minimum copper size was adjusted to correlate with the changes in Article 310.

Response Message: SR-8563-NFPA 70-2024

Public Comment No. 1391-NFPA 70-2024 [Section No. 340.104]



Second Revision No. 8583-NFPA 70-2024 [Section No. 382.4]

382.4 Load-Side Protection.

The starting/source tap device for the extension shall contain and provide the following protection for all load-side extensions and devices:

- (1) Supplementary overcurrent ~~protection~~ protective device
- (2) Level of protection equivalent to a Class A GFCI
- (3) Level of protection equivalent to a portable GFCI
- (4) Line and load-side miswire protection
- (5) Provide protection from the effects of arc faults

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 13:35:51 EDT 2024

Committee Statement

Committee Statement: Editorially corrected to align with the requested change from the CC.

Response Message: SR-8583-NFPA 70-2024



Second Revision No. 8584-NFPA 70-2024 [Section No. 382.42]

382.42– 42 _ Wiring_ Devices.

(A) Receptacles.

All receptacles, receptacle housings, and self-contained wiring_ devices used with concealable nonmetallic extensions shall be identified for this use.

(B) Receptacles and Housings.

Receptacle housings and self-contained wiring_ devices designed either for surface or for recessed mounting shall be permitted for use with concealable nonmetallic extensions. Receptacle housings and self-contained wiring_ devices shall incorporate means for facilitating entry and termination of concealable nonmetallic extensions and for electrically connecting the housing or wiring_ device. Receptacle and self-contained wiring_ devices shall comply with 406.42 26 . Power and communications outlets installed together in common housing shall be permitted in accordance with ~~800~~ 722 .133(A)(3), Exception No. 2.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 13:37:48 EDT 2024

Committee Statement

Committee Statement: Revised to align with the new definition for "wiring device." Editorially corrected the cross references.

Response Message: SR-8584-NFPA 70-2024



Second Revision No. 8582-NFPA 70-2024 [Section No. 382.104(A)]

(A) Ungrounded Conductor (Center Layer).

The ungrounded conductor shall consist of one or more ungrounded flat conductor(s) enclosed in accordance with 382.104(B) and 382.104(C) and identified in accordance with 310.6(C).

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 13:21:05 EDT 2024

Committee Statement

Committee Statement: Editorial reference correction.

Response Message: SR-8582-NFPA 70-2024



Second Revision No. 8564-NFPA 70-2024 [Section No. 394.10]

394.10 Uses Permitted.

Concealed knob-and-tube wiring shall be permitted to be installed in the hollow spaces of walls and ceilings, or in unfinished attics and roof spaces as provided by 394.23, only as follows:

- (1) For extensions of existing installations
- (2) Elsewhere by special permission

~~Informational Note: See 210.12(E) for further information on branch-circuit wiring extensions, modifications, or replacements.~~

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Fri Oct 25 20:45:07 EDT 2024

Committee Statement

Committee Statement: The informational note was deleted to comply with the style manual.

Response Message: SR-8564-NFPA 70-2024

[Public Comment No. 594-NFPA 70-2024 \[Section No. 394.10\]](#)



Second Revision No. 8573-NFPA 70-2024 [Section No. 394.42]

394.42– 42 _ Wiring_ Devices.

Switches shall comply with ~~404~~ 406 .6 9 _ and 406.42(B).

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 11:57:34 EDT 2024

Committee Statement

Committee Statement: Section 394.42 specifically addresses wiring devices. Adding "wiring" to the title aligns with the definition of wiring device. Reference 404.6 was revised to 406.9 since 394.42 addresses wiring devices and not other devices.

Response Message: SR-8573-NFPA 70-2024



Second Revision No. 8607-NFPA 70-2024 [Section No. 400.2]

400.2- Other Articles:

~~Flexible cords and flexible cables shall comply with this article and with the applicable provisions of other articles of this Code .~~

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Tue Oct 29 14:03:32 EDT 2024

Committee Statement

Committee Statement: Section 400.2 was deleted since the use of this code requires the user to comply with the entire NEC.

Response Message: SR-8607-NFPA 70-2024

[Public Comment No. 558-NFPA 70-2024 \[Sections 400.2, 400.3\]](#)



Second Revision No. 8608-NFPA 70-2024 [Section No. 400.3]

[Move Existing 400.3 to 400.7]

400.7 _ Suitability.

Flexible cords and flexible cables and their associated fittings shall be suitable for the conditions of use and location.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Tue Oct 29 14:05:32 EDT 2024

Committee Statement

Committee Statement: Renumbered 400.3 to 400.7 to comply with the style manual.

Response Message: SR-8608-NFPA 70-2024



Second Revision No. 8574-NFPA 70-2024 [Section No. 400.16]

400.16 Overcurrent Protection.

Flexible cords not smaller than 18 AWG, and tinsel cords or cords having equivalent characteristics of smaller size approved for use with specific appliances, shall be ~~considered as protected against overcurrent~~ provided with overcurrent protection in accordance with 240.5.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 12:12:44 EDT 2024

Committee Statement

Committee Statement: Editorial revision per CC request.

Response Message: SR-8574-NFPA 70-2024

Public Comment No. 1646-NFPA 70-2024 [Global Input]



Second Revision No. 8567-NFPA 70-2024 [Section No. 402.2]

~~402.2- Other Articles:~~

~~Fixture wires shall comply with this article and also with the applicable provisions of other articles of this code.~~

~~Informational Note: See Article 410 , Part VI for application in luminaires.~~

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 10:54:33 EDT 2024

Committee Statement

Committee Statement: Section 402.2 was deleted since the use of this code requires the user to comply with the entire NEC.

Response Message: SR-8567-NFPA 70-2024

[Public Comment No. 538-NFPA 70-2024 \[Sections 402.2, 402.3\]](#)



Second Revision No. 8569-NFPA 70-2024 [Section No. 402.3]

[Move 402.3 to 402.13]

402.13 Types.

Fixture wires shall be of a type listed in Table 402.3, and they shall comply with all requirements of that table. The fixture wires listed in Table 402.3 are all suitable for service at 600 volts, nominal, unless otherwise specified.

Informational Note: Thermoplastic insulation may stiffen at temperatures lower than -10°C (+14°F). Thermoplastic insulation may also be deformed at normal temperatures where subjected to pressure, such as at points of support.

Table 402.3 Fixture Wires

<u>Name</u>	<u>Type</u> <u>Letter</u>	<u>Insulation</u>	<u>AWG</u>	<u>mm</u>	<u>mils</u>	<u>Outer</u> <u>Covering</u>	<u>Thickness of Insu</u>	
							<u>Maximum</u> <u>Operating</u> <u>Temperature</u>	<u>Appl</u> <u>Prov</u>
Heat-resistant rubber-covered fixture wire — flexible stranding	FFH-2	Heat-resistant rubber or cross-linked synthetic polymer	18–16	0.76	30	Nonmetallic covering	75°C (167°F)	Fixtur wiring 90 (19
	FFHH-2			-				
ECTFE — solid or 7-strand	HF	Ethylene chloro-trifluoroethylene	18–14	0.38	15	None	150°C (302°F)	Fixtur wiring
ECTFE — flexible stranding	HFF	Ethylene chlorotrifluoroethylene	18–14	0.38	15	None	150°C (302°F)	Fixtur wiring
Tape insulated fixture wire — solid or 7-strand	KF-1	Aromatic polyimide tape	18–10	0.14	5.5	None	200°C (392°F)	Fixtur wiring — lim 300 v
	KF-2	Aromatic polyimide tape	18–10	0.21	8.4	None	200°C (392°F)	Fixtur wiring
Tape insulated fixture wire — flexible stranding	KFF-1	Aromatic polyimide tape	18–10	0.14	5.5	None	200°C (392°F)	Fixtur wiring — lim 300 v
	KFF-2	Aromatic polyimide tape	18–10	0.21	8.4	None	200°C (392°F)	Fixtur wiring
Perfluoro-alkoxy — solid or 7-strand (nickel or nickel-coated copper)	PAF	Perfluoro-alkoxy	18–14	0.51	20	None	250°C	Fixtur wiring (nicke

<u>Name</u>	<u>Type Letter</u>	<u>Insulation</u>	<u>AWG</u>	<u>mm</u>	<u>mils</u>	<u>Outer Covering</u>	<u>Thickness of Insu</u>	
							<u>Maximum Operating Temperature</u>	<u>Appl Prov</u>
							(482°F)	nickel coated copper
Perfluoro-alkoxy — flexible stranding	PAFF	Perfluoro-alkoxy	18–14	0.51	20	None	150°C (302°F)	Fixtur wiring
Fluorinated ethylene propylene fixture wire — solid or 7-strand	PF	Fluorinated ethylene propylene	18–14	0.51	20	None	200°C (392°F)	Fixtur wiring
Fluorinated ethylene propylene fixture wire — flexible stranding	PFF	Fluorinated ethylene propylene	18–14	0.51	20	None	150°C (302°F)	Fixtur wiring
Fluorinated ethylene propylene fixture wire — solid or 7-strand	PGF	Fluorinated ethylene propylene	18–14	0.36	14	Glass braid	200°C (392°F)	Fixtur wiring
Fluorinated ethylene propylene fixture wire — flexible stranding	PGFF	Fluorinated ethylene propylene	18–14	0.36	14	Glass braid	150°C (302°F)	Fixtur wiring
Extruded polytetrafluoroethylene — solid or 7-strand (nickel or nickel-coated copper)	PTF	Extruded polytetrafluoroethylene	18–14	0.51	20	None	250°C (482°F)	Fixtur wiring (nickel coated copper)
Extruded polytetrafluoroethylene — flexible stranding 26-36 (AWG silver or nickel-coated copper)	PTFF	Extruded polytetrafluoroethylene	18–14	0.51	20	None	150°C (302°F)	Fixtur wiring (silver nickel coated copper)
Heat-resistant rubber-covered fixture wire —	RFH-1	Heat-resistant	18	0.38	15	Nonmetallic	75°C	Fixtur wiring

<u>Name</u>	<u>Type Letter</u>	<u>Insulation</u>	<u>AWG</u>	<u>mm</u>	<u>mils</u>	<u>Outer Covering</u>	<u>Thickness of Insu</u>	
							<u>Maximum Operating Temperature</u>	<u>Appl Prov</u>
solid or 7-strand		rubber				covering	(167°F)	— lim 300 v
	RFH-2	Heat-resistant rubber Cross-linked synthetic polymer	18–16	0.76	30	None or non- metallic covering	75°C (167°F)	Fixtur wiring
Heat-resistant cross- linked synthetic polymer-insulated fixture wire — solid or 7-strand	RFHH- 2*	Cross-linked synthetic	18–16	0.76	30	None or non- metallic	90°C	Fixtur wiring
	RFHH- 3*	polymer	18–16	1.14	45	covering	(194°F)	
Silicone insulated fixture wire — solid or 7-strand	SF-1	Silicone rubber	18	0.38	15	Nonmetallic covering	200°C (392°F)	Fixtur wiring — lim 300 v
	SF-2	Silicone rubber	18–12 10	0.76 1.14	30 45	Nonmetallic covering	200°C (392°F)	Fixtur wiring
Silicone insulated fixture wire — flexible stranding	SFF-1	Silicone rubber	18	0.38	15	Nonmetallic covering	150°C (302°F)	Fixtur wiring — lim 300 v
	SFF-2	Silicone rubber	18–12 10	0.76 1.14	30 45	Nonmetallic covering	150°C (302°F)	Fixtur wiring
Thermoplastic covered fixture wire — solid or 7-strand	TF*	Thermoplastic	18–16	0.76	30	None	60°C (140°F)	Fixtur wiring
Thermoplastic covered fixture wire — flexible stranding	TFF*	Thermoplastic	18–16	0.76	30	None	60°C (140°F)	Fixtur wiring
Heat-resistant thermoplastic covered fixture wire — solid or 7-strand	TFN*	Thermoplastic	18–16	0.38	15	Nylon- jacket-	90°C	Fixtur wiring

<u>Name</u>	<u>Type Letter</u>	<u>Insulation</u>	<u>AWG</u>	<u>mm</u>	<u>mils</u>	<u>Outer Covering</u>	<u>Thickness of Insu</u>	
							<u>Maximum Operating Temperature</u>	<u>Appl Prov</u>
						ed or equivalent	(194°F)	
Heat-resistant thermoplastic covered fixture wire — flexible stranded	TFFN*	Thermoplastic	18–16	0.38	15	Nylon- jacket- ed or equivalent	90°C (194°F)	Fixtur wiring
Cross-linked polyolefin insulated fixture wire — solid or 7-strand	XF*	Cross-linked polyolefin	18–14	0.76	30	None	150°C	Fixtur wiring
			12-10	1.14	45		(302°F)	— lim 300 v
Cross-linked polyolefin insulated fixture wire — flexible stranded	XFF*	Cross-linked polyolefin	18–14	0.76	30	None	150°C	Fixtur wiring
			12–10	1.14	45		(302°F)	— lim 300 v
Modified ETFE — solid or 7-strand	ZF	Modified ethylene tetrafluoro- ethylene	18–14	0.38	15	None	150°C (302°F)	Fixtur wiring
Modified ETFE — flexible stranding	ZFF	Modified ethylene tetrafluoro- ethylene	18–14	0.38	15	None	150°C (302°F)	Fixtur wiring
High temp. modified ETFE— solid or 7- strand	ZHF	Modified ethylene tetrafluoro- ethylene	18–14	0.38	15	None	200°C	Fixtur wiring
							(392°F)	

*Insulations and outer coverings that meet the requirements of flame retardant, limited smoke, and are so listed, shall be permitted to be marked for limited smoke after the code type designation.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 11:06:10 EDT 2024

Committee Statement

Committee Statement: Renumbered 402.3 to 402.13 to comply with the style manual. Cross reference for 402.3 will have to be reviewed and revised to 402.13 in other articles.

Response Message: SR-8569-NFPA 70-2024



Second Revision No. 8592-NFPA 70-2024 [Sections 402.5, 402.6]

Sections 402.5, 402.6

402.5 Ampacities for Fixture Wires.

The ampacity of fixture wire shall be as specified in Table 402.5.

No conductor shall be used under such conditions that its operating temperature exceeds the temperature specified in Table 402.3 13 for the type of insulation involved.

Informational Note: See 310.14(A)(3) for temperature limitation of conductors.

Table 402.5 Ampacity for Fixture Wires

<u>Size (AWG)</u>	<u>Ampacity</u>
18 copper- or	<u>6</u>
16 <u>solid</u> copper-clad aluminum	6
16 copper- or	<u>8</u>
14 <u>solid</u> copper-clad aluminum	8
14 copper	17
12 copper	23
10 copper	28

402.6 Minimum Size.

Fixture wires shall not be smaller than ~~18 AWG~~ the following:

- 1) 18 AWG solid or stranded copper
- 2) 16 AWG solid copper-clad aluminum

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 14:43:48 EDT 2024

Committee Statement

Committee Statement: Based on test data on copper-clad aluminum conductors provided during this revision cycle copper-clad aluminum was limited to solid conductors as testing was on solid conductors only.

Response Message: SR-8592-NFPA 70-2024

Public Comment No. 1744-NFPA 70-2024 [Section No. 402.6]

Public Comment No. 2029-NFPA 70-2024 [Section No. 402.5]



Second Revision No. 8570-NFPA 70-2024 [Section No. 402.9(B)]

(B) Optional Marking.

Fixture wire types listed in Table 402.3 13 shall be permitted to be surface marked to indicate special characteristics of the cable materials. These markings include, but are not limited to, markings for limited smoke, sunlight resistance, and so forth.

Submitter Information Verification

Committee: NEC-P06

Submittal Date: Sat Oct 26 11:09:45 EDT 2024

Committee Statement

Committee Statement: Section 402.3 was renumbered to 402.13, updated cross reference.

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