Second Revision No. 1502-NFPA 70-2015 [ Global Comment ]

Throughout Article 400 add the word "flexible" in front of "cable" where the term "flexible cord and cable" appear. Do not make this change within a document title.

Submitter Information Verification

Submitter Full Name: CMP 6
Organization: [ Not Specified ]
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Submittal Date: Mon Nov 02 13:44:12 EST 2015

Committee Statement

Committee Statement: This change is based on the recommendation from the correlating committee per the statement in PC#1740.
Response Message:

Public Comment No. 1740-NFPA 70-2015 [Part I.]
Second Revision No. 1506-NFPA 70-2015 [Detail]

See Attached Word Document [310.15(B)(3)_1506_CD]

Supplemental Information

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Submitter Information Verification

Submitter Full Name: CMP 6  
Organization: [Not Specified]  
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Tue Nov 03 12:48:31 EST 2015

Committee Statement

Committee Statement: No instances of compromised safety were submitted to the panel to support the prohibition against using the Exception in 310.15(A)(2). While the language in 310.15(A)(2) Exception and 310.15(B)(3)(a) may conflict in a limited number of cases, more information needs to be submitted to the panel.

The rewrite of 310.15(B)(3)(a)(4) exception to “4” makes it clear that the exception applies to the same size, type and construction of cables, but that an adjustment factor is necessary for a different installation condition than indicated in list item (d). The exception language and placement is in accordance with the NEC Style Manual 2.6.1 and addresses the CC concerns.

The committee agrees to delete the language in 310.15(B)(3)(a)(5) as recommended in PI 3375 and PC 1041; those changes were not properly reflected in the First Draft.

Response Message:

Public Comment No. 1041-NFPA 70-2015 [Section No. 310.15(B)(3)]
Public Comment No. 1293-NFPA 70-2015 [Section No. 310.15(B)(3)]
Public Comment No. 1630-NFPA 70-2015 [Section No. 310.15(B)(3)]
Public Comment No. 1789-NFPA 70-2015 [Section No. 310.15(B)(3)]
(3) Adjustment Factors.

(a) More than Three Current-Carrying Conductors. Where the number of current-carrying conductors in a raceway or cable exceeds three, or where single conductors or multiconductor cables are installed without maintaining spacing for a continuous length longer than 600 mm (24 in.) and are not installed in raceways, the allowable ampacity of each conductor shall be reduced as shown in Table 310.15(B)(3)(a). Section 310.15(A)(2) exception shall not apply. Each current-carrying conductor of a paralleled set of conductors shall be counted as a current-carrying conductor.

Where conductors of different systems, as provided in 300.3, are installed in a common raceway or cable, the adjustment factors shown in Table 310.15(B)(3)(a) shall apply only to the number of power and lighting conductors (Articles 210, 215, 220, and 230).

Informational Note No. 1: See Annex B for adjustment factors for more than three current-carrying conductors in a raceway or cable with load diversity.

Informational Note No. 2: See 366.23 for adjustment factors for conductors and ampacity for bare copper and aluminum bars in auxiliary gutters and 376.22(B) for adjustment factors for conductors in metal wireways.

(1) Where conductors are installed in cable trays, the provisions of 392.80 shall apply.

(2) Adjustment factors shall not apply to conductors in raceways having a length not exceeding 600 mm (24 in.).

(3) Adjustment factors shall not apply to underground conductors entering or leaving an outdoor trench if those conductors have physical protection in the form of rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit (PVC), or reinforced thermosetting resin conduit (RTRC) having a length not exceeding 3.05 m (10 ft), and if the number of conductors does not exceed four.

(4) Adjustment factors shall not apply to Type AC cable or to Type MC cable under the following conditions:
   a. The cables do not have an overall outer jacket.
   b. Each cable has not more than three current-carrying conductors.
   c. The conductors are 12 AWG copper.
   d. Not more than 20 current-carrying conductors are installed without maintaining spacing, are stacked, or are supported on "bridle rings."

Exception to (4): If cables meeting the requirements in (4)a through c with more than 20 current-carrying conductors are installed for longer than 600 mm (24 in.) without maintaining spacing, are stacked, or are supported on bridle rings, a 60 percent adjustment factor shall be applied. A 60 percent adjustment factor shall be applied if the current-carrying conductors in these cables that are stacked or bundled longer than 600 mm (24 in.) without maintaining spacing exceeds 20.

(5) An adjustment factor of 60 percent shall be applied to Type AC cable or Type MC cable under the following conditions:
   a. The cables do not have an overall outer jacket.
   b. The number of current-carrying conductors exceeds 20.
   c. The cables are stacked or bundled longer that 600 mm (24 in.) without spacing being maintained.
Second Revision No. 1505-NFPA 70-2015 [ Section No. 310.15(B)(7) ]

(7) Single-Phase Dwelling Services and Feeders.

For one-family dwellings and the individual dwelling units of two-family and multifamily dwellings, service and feeder conductors supplied by a single-phase, 120/240-volt system shall be permitted to be sized in accordance with 310.15(B)(7)(1) through (4).

Single-phase-feeders For one-family dwellings and the individual dwelling units of two-family and multifamily dwellings, single-phase feeder conductors consisting of 2 ungrounded conductors and the neutral conductor from a 208Y/120 volt system shall be permitted to be sized in accordance with 310.15(B)(7)(1) through (4) (3).

(1) For a service rated 100 through 400 amperes, the service conductors supplying the entire load associated with a one-family dwelling, or the service conductors supplying the entire load associated with an individual dwelling unit in a two-family or multifamily dwelling, shall be permitted to have an ampacity not less than 83 percent of the service rating.

(2) For a feeder rated 100 through 400 amperes, the feeder conductors supplying the entire load associated with a one-family dwelling, or the feeder conductors supplying the entire load associated with an individual dwelling unit in a two-family or multifamily dwelling, shall be permitted to have an ampacity not less than 83 percent of the feeder rating.

(3) In no case shall a feeder for an individual dwelling unit be required to have an ampacity greater than that specified in 310.15(B)(7)(1) or (2).

(4) Grounded conductors shall be permitted to be sized smaller than the ungrounded conductors, if the requirements of 220.61 and 230.42 for service conductors or the requirements of 215.2 and 220.61 for feeder conductors are met.

Where correction or adjustment factors are required by 310.15(B)(2) or (3), they shall be permitted to be applied to the ampacity associated with the temperature rating of the conductor.

Informational Note No. 1: The service or feeder ratings addressed by this section are based on the standard ampacity ratings from 240.6(A).

Informational Note No. 2: See Example D7 in Annex D.

Submitter Information Verification

Submitter Full Name: CMP 6
Organization: [ Not Specified ]
Street Address:
City:
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Submittal Date: Tue Nov 03 11:38:27 EST 2015

Committee Statement
| Committee | The construction of a second paragraph for the 208Y/120-volt system requires the addition of the same limited-dwelling application text in order to remove any ambiguity the addition of the second paragraph might cause. |
| Statement | The addition of the system description text in the second paragraph is to further clarify its exact meaning. |
|           | The 208Y/120-volt application is limited to (1) through (3) due to the fact that the neutral of that system is a current-carrying conductor and must always be full sized in accordance with 220.61, and therefore the reduced neutral sizing allowed by (4) can never be applied. |
|           | The translation of the last paragraph into list item (5) during the First Revision Terra processing was in error. There is no list item (5). |

**Response**

**Message:**

Public Comment No. 1159-NFPA 70-2015 [Section No. 310.15(B)(7)]
400.1 Scope.

This article covers general requirements, applications, and construction specifications for flexible cords and flexible cables.

Informational Note: UL 817, Cord Sets and Power-Supply Cords, allows the use of flexible cords manufactured in accordance with UL 62, Flexible Cords and Cables. Cord sets and The flexible cord that is part of a listed cord set or that is a power-supply cords are restricted in use by the requirements in Article 400.

Submitter Information Verification

Submitter Full Name: CMP 6
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City:
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Committee Statement

Committee: The code does not presently advise that cords used in listed cord sets and power Statement: supply cords need to meet the same installation requirements as flexible cords in article 400. The informational note was included to advise that flexible cords used in listed cord sets and power supply cords are covered by this article.

Response
Message:

Public Comment No. 446-NFPA 70-2015 [Section No. 400.1]
Second Revision No. 1504-NFPA 70-2015 [ Section No. 400.12 ]

400.12 Uses Not Permitted.

Unless specifically permitted in 400.10, flexible cables, flexible cord sets, and power supply cords shall not be used for the following:

) As a substitute for the fixed wiring of a structure
) Where run through holes in walls, structural ceilings, suspended ceilings, dropped ceilings, or floors
) Where run through doorways, windows, or similar openings
) Where attached to building surfaces

   Exception to (4): Flexible cord and flexible cable shall be permitted to be attached to building surfaces in accordance with 368.56(B).

) Where concealed by walls, floors, or ceilings or located above suspended or dropped ceilings

   Exception to (5): Flexible cord and flexible cable shall be permitted if contained within an enclosure for use in Other Spaces Used for Environmental Air, as permitted by 300.22(C)(3).

) Where installed in raceways, except as otherwise permitted in this Code
) Where subject to physical damage

Supplemental Information

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Submitter Full Name: CMP 6  
Organization: [ Not Specified ]  
Street Address: 
City:  
State:  
Zip:  
Submittal Date: Mon Nov 02 14:56:56 EST 2015

Committee Statement
Committee: The panel recognizes that the installation described by PC#200 is permitted elsewhere in the code and should be permitted in Article 400. However, in order not to continue to add to uses permitted, the panel has decided to place an exception to 400.12(5).

Response Message:

Public Comment No. 200-NFPA 70-2015 [New Section after 400.10(A)]
(2) Typical Applications Covered by Tables.

Typical ampacities for conductors rated 0 through 2000 volts are shown in Table B.310.15(B)(2)(1) through Table B.310.15(B)(2)(10). Table B.310.15(B)(2)(11) provides the adjustment factors for more than three current-carrying conductors in a raceway or cable with load diversity. Underground electrical duct bank configurations, as detailed in Figure B.310.15(B)(2)(3), Figure B.310.15(B)(2)(4), and Figure B.310.15(B)(2)(5), are utilized for conductors rated 0 through 5000 volts. In Figure B.310.15(B)(2)(2) through Figure B.310.15(B)(2)(5), where adjacent duct banks are used, a separation of 1.5 m (5 ft) between the centerlines of the closest ducts in each bank or 1.2 m (4 ft) between the extremities of the concrete envelopes is sufficient to prevent derating of the conductors due to mutual heating. These ampacities were calculated as detailed in the basic ampacity paper, AIEE Paper 57-660, *The Calculation of the Temperature Rise and Load Capability of Cable Systems*, by J. H. Neher and M. H. McGrath. For additional information concerning the application of these ampacities, see IEEE/IEA Standard S-135-1975, *Power Cable Ampacities*, and IEEE Standard IEEE STD 835-1994, *Standard Power Cable Ampacity Tables*.

Typical values of thermal resistivity (Rho) are as follows:

- Average soil (90 percent of USA) = 90
- Concrete = 55
- Damp soil (coastal areas, high water table) = 60
- Paper insulation = 550
- Polyethylene (PE) = 450
- Polyvinyl chloride (PVC) = 650
- Rubber and rubber-like = 500
- Very dry soil (rocky or sandy) = 120

*Thermal resistivity*, as used in this informative annex, refers to the heat transfer capability through a substance by conduction. It is the reciprocal of thermal conductivity and is normally expressed in the units°C·cm/watt. For additional information on determining soil thermal resistivity (Rho), see ANSI/IEEE Standard ANSI/IEEE STD 442-1996, *Guide for Soil Thermal Resistivity Measurements*.

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**Submittal Date:** Mon Nov 02 11:54:18 EST 2015
Committee Statement

Committee Statement: Removed superseded national standards.
Response Message:
Public Comment No. 43-NFPA 70-2015 [Section No. B.310.15(B)(2)]