



National Fire Protection Association

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

Memorandum

To: Technical Committee on Single- and Multiple-Station Alarms and Household Signaling Systems
From: Jenny Depew *Administrator, Technical Projects*
Subject: Working Draft of Committee Meeting Output
Date: September 5, 2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT

- CONTENT NOT FINAL - SUBJECT TO REVISION PRIOR TO LETTER BALLOT AND PUBLICATION OF FIRST DRAFT REPORT

Document: NFPA 72
Revision Cycle: A2021
Meeting Date(s): July 22-24, 2019
Committee Activity: Input Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Technical Committee's First Draft Meeting. It includes draft copies of the First Revisions and any Global Revisions.

This draft is being made available to Committee members for the purpose of facilitating early review, particularly for those Committee members who may be seeking input from their respective organizations, in preparation for the Letter Ballot of the Committee.

Please be aware, however, that this is a working draft, subject to further editing and/or correction and may not reflect the final content either of the First Draft Ballot or the First Draft Report.

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5178-NFPA 72-2019 [Global Input]

In Chapter 29 and associated annex material use the term "carbon monoxide" rather than "CO" or "carbon monoxide (CO)".

The intent is that carbon monoxide (CO) appear only once in Chapter 29 and associated annex material. That appearance is in 29.2.2 as covered in FR-5177.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Wed Jul 24 13:11:10 EDT 2019

Committee Statement

Committee Statement: The abbreviation "(CO)" has been added in the first instance of the term "carbon monoxide" in 29.2.2 to ensure compatibility with the rest of the Code. All other instances of "carbon monoxide (CO)" or "(CO)" have been changed to only the term "carbon monoxide" for consistency across Chapter 29 and associated annex material.

Response Message: FR-5178-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5123-NFPA 72-2019 [Detail]

Modify 7.8.2(3) as follows:

Where a form is required by the AHJ to document the installation and inspection of a household fire alarm system or single- or multiple-station alarms, Figure 7.8.2(m) ~~can~~ shall be permitted to be used to document the record of completion and inspection. (SIG-HOU)

Modify title of Figure 7.8.2(m) as follows:

Figure 7.8.2(m) Installation and Inspection Form Single- and Multiple-Station Alarms and Household Fire Alarm Systems. (SIG-HOU)

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 16:26:22 EDT 2019

Committee Statement

Committee Statement: Substituting "shall be permitted to be" for "can" complies with the Manual of Style.

Response Message: FR-5123-NFPA 72-2019

Public Input No. 143-NFPA 72-2019 [Section No. 7.8.2]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5118-NFPA 72-2019 [Section No. 3.3.171]

3.3.171 – Multiple-Station Alarm Device.

~~Two or more single-station alarm devices that can be interconnected so that actuation of one causes all integral or separate audible alarms to operate; or one single-station alarm device having connections to other detectors or to a manual fire alarm box. (SIG-HOU)~~

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 15:48:30 EDT 2019

Committee Statement

Committee Statement: The defined term is not used in the body of the Code.

Response Message: FR-5118-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5115-NFPA 72-2019 [Section No. 3.3.258]

3.3.258*—~~Separate~~ _ Sleeping Area.

The area of a dwelling unit where the bedrooms or sleeping rooms are located. (SIG-HOU)

A.3.3.258—~~Separate~~ _ Sleeping Area.

Bedrooms (or sleeping rooms) separated by other use areas, such as kitchens or living rooms (but not bathrooms), are considered separate sleeping areas.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 15:16:57 EDT 2019

Committee Statement

Committee Statement: Separate sleeping area is a term not used within the Code. Sleeping area is the term used in Chapter 29.

Response Message: FR-5115-NFPA 72-2019

Public Input No. 20-NFPA 72-2018 [Section No. 3.3.258]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5116-NFPA 72-2019 [Section No. 3.3.270]

3.3.270 – Single-Station Alarm Device.

An assembly that incorporates the detector, the control equipment, and the alarm-sounding device in one unit operated from a power supply either in the unit or obtained at the point of installation. (SIG-HOU)

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 15:26:19 EDT 2019

Committee Statement

Committee Statement: The defined term is not used in the body of the Code.

Response Message: FR-5116-NFPA 72-2019

Public Input No. 538-NFPA 72-2019 [Section No. 3.3.270]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5344-NFPA 72-2019 [Section No. 29.2.2]

29.2.2

Carbon monoxide (CO) warning equipment for residential occupancies shall provide a reliable means to notify the occupants of the presence of carbon monoxide levels that constitute a potential life safety risk and the need for action as a consequence of those levels.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Thu Aug 29 09:06:16 EDT 2019

Committee Statement

Committee Statement: The abbreviation "(CO)" is added in the first instance of the term "carbon monoxide" in 29.2.2 to ensure compatibility with the rest of the Code.

Response Message: FR-5344-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5075-NFPA 72-2019 [Section No. 29.3.1]

29.3.1—* _

All devices, combinations of devices, and equipment to be installed in conformity with this chapter shall be approved, labeled or listed for the purposes for which they are intended.

A.29.3.1 Terms used by testing laboratories for equipment that is listed or labeled under the definitions of this Code could include: certified, approved, listed, recognized, etc.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 09:08:45 EDT 2019

Committee Statement

Committee Statement: Labeled is defined by this Code and can include the use of a “certified” mark or label from a recognized testing laboratory.

Response Message: FR-5075-NFPA 72-2019

Public Input No. 314-NFPA 72-2019 [Section No. 29.3.1]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5025-NFPA 72-2019 [Section No. 29.5]

Reorganize Section 29.5 as shown in attached file.

29.5 Notification.

29.5.1*

Unless otherwise permitted by 29.5.2, fire-warning equipment to be installed in residential occupancies shall produce the audible emergency evacuation signal described in ANSI/ASA S3.41, *American National Standard Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)*, whenever the intended response is to evacuate the building.

29.5.2

Where mechanically powered single-station heat alarms are used as supplementary devices, unless required by applicable laws, codes, or standards, such devices shall not be required to produce the emergency evacuation signal described in ANSI/ASA S3.41, *American National Standard Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)*.

29.5.3*

29.5.3.1

Carbon monoxide alarms shall have a minimum rating of 85 dBA at 10 ft (3 m).

29.5.3.2

Carbon monoxide-warning equipment to be installed in residential occupancies shall produce the T-4 signal. After the initial 4 minutes of alarm, the 5-second "off" time of the alarm signal shall be permitted to be changed to 60 seconds $\pm$ 10 percent.

29.5.4

The audible emergency evacuation signal shall be permitted to be used for other devices as long as the desired response is immediate evacuation.

29.5.5*

Fire-warning equipment producing the audible emergency evacuation signal shall be permitted to incorporate voice notification under either or both of the following conditions:

- (1) Where the voice message is contained completely within the 1.5-second pause period of the audible emergency evacuation signal
- (2) Where the voice message complies with 29.5.5(2)(a) and 29.5.5(2)(b) as follows:
 - (3) The voice message is first preceded by a minimum of eight cycles of the audible emergency evacuation signal.
 - (4) The voice message periodically interrupts the signal for no longer than 10 seconds, followed by a minimum of two cycles of the audible emergency evacuation signal between each voice message. The initial eight-cycle period shall not be required to be repeated.

29.5.6*

Carbon monoxide-warning equipment producing the audible notification signal shall be permitted to incorporate voice notification under either or both of the following:

- (1) Where the voice message is contained completely within the 5-second pause period of the audible notification signal
- (2) Where the voice message complies with 29.5.6(2)(a) and 29.5.6(2)(b) as follows:
 - (a) The voice message is first preceded by a minimum of 6 cycles of the audible notification signal.
 - (b) The voice message periodically interrupts the signal for no longer than 10 seconds, followed by a minimum of two cycles of the audible notification signal between each voice message. The initial 6-cycle period shall not be required to be repeated.

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

29.5.7

All audible notification signals installed shall meet the performance requirements of 18.4.4, 18.4.6.1, 18.4.6.2, and 29.5.10.

29.5.8*

Where visual appliances are provided, they shall meet the requirements of Section 18.5.

29.5.9

Since hearing deficits are often not apparent, the responsibility for advising the appropriate person(s) of the existence of this deficit shall be that of the party with hearing loss.

29.5.10

Notification appliances provided in sleeping rooms and guest rooms for those with hearing loss shall comply with 29.5.10.1 and 29.5.10.2, as applicable.

29.5.10.1* Mild to Severe Hearing Loss.

Notification appliances provided for those with mild to severe hearing loss shall comply with the following:

- (1) An audible notification appliance producing a low frequency alarm signal shall be installed in the following situations:
 - (2) Where required by governing laws, codes, or standards for people with hearing loss
 - (3) Where provided voluntarily for those with hearing loss
- (4)* The low frequency alarm signal output shall comply with the following:
 - (5) The waveform shall have a fundamental frequency of 520 Hz $\pm$ 10 percent.
 - (6) The minimum sound level at the pillow shall be 75 dBA, or 15 dB above the average ambient sound level, or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater.

29.5.10.2* Moderately Severe to Profound Hearing Loss.

Visual notification appliances in accordance with the requirements of 18.5.5.8 and tactile notification appliances in accordance with the requirements of Section 18.10 shall be required for those with moderately severe to profound hearing loss in the following situations:

- (1)* Where required by governing laws, codes, or standards for people with hearing loss
- (2) Where provided voluntarily for those with hearing loss

29.5.11

Signals from notification appliances shall not be required to be synchronized.

Supplemental Information

File Name	Description	Approved
FR_5025_revised_text_for_29.5.docx	revision for FR 5025. For staff use.	
72_HOU_FR-5025_A.29.5.1.docx	For staff use	

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Jul 22 13:00:27 EDT 2019

Committee Statement

Committee Statement: Section 29.5 was reorganized to improve flow and grouping of similar requirements. The minimum dB level for CO alarms was removed because it is part of the product standard. For A.29.5.1, the text was updated to replace the address with the website at which the standards can be purchased.

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

Response FR-5025-NFPA 72-2019

Message:

[Public Input No. 284-NFPA 72-2019 \[Section No. 29.5\]](#)

SUBJECT TO REVISION - NOT FOR PUBLICATION

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5164-NFPA 72-2019 [Section No. 29.9.1]

29.9.1 Smoke and Heat and Carbon Monoxide Alarms.

Smoke and heat and carbon monoxide alarms shall meet the requirements of 29.8.2.1.1 and be powered by one of the following means:

- (1) A commercial light and power source along with a secondary power source that is capable of operating the device for at least 7 days in the normal condition, followed by 4 minutes of alarm. Carbon monoxide alarms shall have sufficient capacity to operate the alarm signal(s) for at least 12 continuous hours.
- (2) If a commercial light and power source is not normally available, a dependable, noncommercial ac power source along with a secondary power source that is capable of operating the device for at least 7 days in the normal condition, followed by 4 minutes of alarm for smoke and heat alarms or 12 hours of alarm for carbon monoxide alarms.
- (3) A nonrechargeable, nonreplaceable primary battery that meets the requirements of 29.9.2.
- (4) If a battery primary power supply is specifically permitted by governing laws , codes or standards, a battery meeting the requirements of 29.9.7 or the requirements of 29.9.2.
- (5) A suitable spring-wound mechanism for the nonelectrical portion of a listed single-station alarm with a visible indication to show that sufficient operating power is not available.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Wed Jul 24 11:02:23 EDT 2019

Committee Statement

Committee Statement: Text was added in Item 4 to clarify where special permission can come from.

Response Message: FR-5164-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5163-NFPA 72-2019 [Section No. 29.9.2]

29.9.2 Primary Power Source Nonreplaceable Primary Battery.

If smoke, heat, or carbon monoxide alarms are powered by a nonrechargeable, nonreplaceable primary battery, the battery shall be monitored to ensure the following conditions are met:

- (1) All smoke alarm power requirements are met for at least 10 years of battery life, including required periodic testing.
- (2) ~~All Single station carbon monoxide alarm power requirements are met for the service life of the sensor life specified by the manufacturer's published instructions, not to exceed 10 years at least 10 years of battery life, including required periodic testing .~~
- (3) Multiple-station alarm power requirements are met for at least 7 years of battery life, including required periodic testing .
- (4) A distinctive audible trouble signal occurs before the battery is incapable of operating the device(s) for alarm purposes.
- (5) At the battery voltage at which a trouble signal is obtained, the unit is capable of producing a fire alarm signal for at least 4 minutes, or a carbon monoxide alarm signal for at least 12 continuous hours in accordance with 29.5.3, followed by not less than 7 days of trouble signal operation.
- (6) The audible trouble signal is produced at least once every minute for 7 consecutive days.
- (7) The trouble signal is allowed to be silenced for up to 12 hours.
- (8) A visible "power on" indicator is provided.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Wed Jul 24 10:59:41 EDT 2019

Committee Statement

Committee Statement: Item (2) The requirements for carbon monoxide alarms was revised to establish a minimum requirement that aligns with single station smoke alarms.

Item (3) The requirements for multiple-station alarms was revised to establish a minimum requirement for long-life alarms. To encourage the use of interconnected alarms, the required battery life has been adjusted to accommodate for the increased load.

Response Message: FR-5163-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5092-NFPA 72-2019 [Section No. 29.10.7.8.2]

29.10.7.8.2

Single- or multiple-station smoke alarms shall be permitted to be connected to system control ~~equipment~~ units located within the dwelling unit.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 10:54:44 EDT 2019

Committee Statement

Committee Statement: The term "control equipment" is not defined in the Code. The term "control unit" is defined and is the term that is appropriate to convey the intended meaning.

Response Message: FR-5092-NFPA 72-2019

Public Input No. 565-NFPA 72-2019 [Section No. 29.10.7.8.2]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5094-NFPA 72-2019 [Section No. 29.10.7.8.3]

29.10.7.8.3

When connected, the actuation of a single- or multiple-station smoke alarm shall initiate an alarm signal at the system control ~~equipment located~~ units located within the dwelling unit.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 11:01:44 EDT 2019

Committee Statement

Committee Statement: The term "control equipment" is not defined in the Code. The term "control unit" is defined and is the term that is appropriate to convey the intended meaning.

Response Message: FR-5094-NFPA 72-2019

[Public Input No. 567-NFPA 72-2019 \[Section No. 29.10.7.8.3\]](#)

[Public Input No. 575-NFPA 72-2019 \[Section No. 29.10.7.8.3\]](#)

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5095-NFPA 72-2019 [Section No. 29.10.8.2.1]

29.10.8.2.1*

To ensure adequate transmission and reception capability, ~~nonsupervised,~~ Nonsupervised, low-power wireless alarms shall be capable of reliably communicating at a distance of 100 ft (30.5 m) indoors as tested to an equivalent open area test distance, D_{EOAT} , between two devices in accordance with Equations 29.10.8.2.1a and 29.10.8.2.1b.

$$D_{EOAT} = 30.5 \times \left(10^{\frac{L_b}{40}} \right)$$

[29.10.8.2.1a] ~~where:~~

L_b = the building attenuation factor

$$L_b = 4 \times L_w + 2 \times L_f \quad \text{[29.10.8.2.1b]}$$

where: L_w = ~~attenuation value of a wall = 2 x~~ L_4 ~~+ L_2 L_f = attenuation value of a floor = L_4 +~~

L_2 ~~+ L_3 + L_4 L_4 = frequency dependent attenuation value for $\frac{1}{2}$ in. (13 mm)~~

~~drywall L_2 = frequency dependent attenuation value for $\frac{1}{2}$ in. (38 mm) structural~~

~~lumber L_3 = frequency dependent attenuation value for $\frac{3}{4}$ in. (19 mm)~~

~~plywood L_4 = frequency dependent attenuation value for $\frac{1}{2}$ in. (13 mm) glass/tile floor~~

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

A.29.10.8.2.1 –

SUBJECT TO REVISION - NOT FOR PUBLICATION

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

For RF waves traveling along the earth's surface, the signal power loss (in dB), L_p , can be calculated using the following plane-earth propagation loss model:

$$L_p = 10 \log \left[\frac{D_p^4}{h_{TX}^2 h_{RX}^2} \right] \quad [\text{A.29.10.8.2.1}]$$

where D_p represents the distance between the transmitter and receiver and h_{TX} and h_{RX} are the heights of the transmitter and receiver, respectively, above the earth.

The plane-earth propagation model is a practical simplification and requires that h_{TX} , $h_{RX} \ll D_p$. It reflects the average expected attenuation due to distance of the RF carrier for a stationary set of radios with an essentially clear line of sight. It predicts maximum communications range only in the UHF band (300 MHz to 3 GHz) and is not dependent on frequency.

Inside a building, the model can be expanded to determine the total path loss, L_T , which includes the plane-earth loss, L_p (equation A.29.10.8.2.1a), and the loss due to the building materials in the propagation path, L_b , as follows:

$$L_T = 10 \log \left[\frac{D_p^4}{(h_{TX} h_{RX})^2} \right] + L_b \quad [\text{A.29.10.8.2.1}]$$

If an equivalent open-area test distance, D_{EOAT} , is defined as follows:

$$L_T = 10 \log \left[\frac{D_{EOAT}^4}{(h_{TX} h_{RX})^2} \right] \quad [\text{A.29.10.8.2.1c}]$$

then D_{EOAT} can be shown to be:

$$D_{EOAT} = 10^{\frac{-L_T}{40}} \sqrt{h_{TX}} \sqrt{h_{RX}} = D_p \cdot 10^{\frac{L_b}{40}} \quad [\text{A.29.10.8.2.1d}]$$

The D_{EOAT} function is used to calculate a test distance required to verify the functional range of wireless alarm products. As noted above in the right side of equation A.29.10.8.2.1d, the function represents two factors — one that describes the attenuation of a radio frequency signal due to plane earth propagation path loss (D_p), and one that describes the dwelling material losses (L_b) in the signal's propagation path. It is the combination of dwelling loss and propagation path loss that is used in the calculation of the test distance D_{EOAT} . The losses are expressed in dB, and the unit for distances is meter.

In reviewing average home sizes, a reliable (indoor) communication of 100 ft (30.5 m) is adequate for a majority of dwellings, based on an average house size of 2200 ft² (204 m²) [National Association of Home Builders]. Construction materials of a home (walls and floors) can attenuate an RF signal, with the RF signal being attenuated more at higher frequencies [Stone, 1997]. Communication specifications for devices of this type are typically specified as open field (no obstructions) test distances and not in terms of attenuation. Therefore, the standard specifies a minimum open-area test distance, D_{EOAT} , that the RF products must communicate. This distance is equal to 100 ft (30.5 m) (the longest straight line distance within a majority of homes) plus an additional distance that is equivalent to the attenuation of four walls and two floors (the most straight line obstructions in a majority of homes). The additional distance varies depending on the operating frequency of the product. Formulas for calculating D_{EOAT} are included below, along with examples for a number of different frequencies. These criteria are expected to yield reliable indoor communications at 100 ft (30.5 m) when used inside a majority of dwellings.

The building attenuation factor, L_b , represents the maximum attenuation value of typical floors and walls within a majority of structures. L_b is calculated using attenuation values of different materials. The following method is used to calculate L_b . The building materials attenuation coefficients specified in this application are taken from Stone, 1997. Other sources of appropriate building material attenuation coefficients can be used; however, testing organizations should apply values consistently for all products tested.

L_1 = frequency-dependent attenuation value for $\frac{1}{2}$ in. (13 mm) drywall

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

L_2 = frequency-dependent attenuation value for $1\frac{1}{2}$ in. (38 mm) structural lumber

L_3 = frequency-dependent attenuation value for $\frac{3}{4}$ in. (19 mm) plywood

L_4 = frequency-dependent attenuation value for $\frac{1}{2}$ in. (13 mm) glass/tile floor

L_w = Attenuation value of a wall = $2 \times L_1 + L_2$

L_f = Attenuation value of a floor = $L_1 + L_2 + L_3 + L_4$

Assuming four walls and two floors,

$$L_b = 4 \times L_w + 2 \times L_f \quad \text{[A.29.10.8.2.1]}$$

The source for the equation in 29.10.8.2.1 is Stone, W. "Electromagnetic Attenuation in Construction Materials," National Institute of Standards and Technology, NISTIR 6055, 1997.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 11:10:56 EDT 2019

Committee Statement

Committee Statement: The detail on testing interconnection of nonsupervised wireless alarms was added to NFPA 72 in 2010 because there were products on the market at that time and no reference to testing the wireless interconnection in the UL 217 product standard. Since that time, wireless interconnection has been incorporated into UL 217 and is being further refined as part of the regular ANSI process. The text is modified to establish performance criteria and remove test details that are being incorporated into UL 217.

Response Message: FR-5095-NFPA 72-2019

[Public Input No. 533-NFPA 72-2019 \[Section No. 29.10.8.2\]](#)

[Public Input No. 149-NFPA 72-2019 \[Section No. 29.10.8.2.1\]](#)

[Public Input No. 311-NFPA 72-2019 \[Section No. 29.10.8.2.1\]](#)

[Public Input No. 312-NFPA 72-2019 \[Section No. A.29.10.8.2.1\]](#)

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5343-NFPA 72-2019 [Section No. 29.10.9.10 [Excluding any Sub-Sections]]

Communications methods shall comply with 29.10.9.10.1 through 29.10.9.10.6 7 .

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Aug 26 15:22:30 EDT 2019

Committee Statement

Committee Statement: Editorial change to include new subsection added to section.

Response Message: FR-5343-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5098-NFPA 72-2019 [New Section after 29.10.9.10.6]

29.10.9.10.7 Transmission devices connected to the supervising station shall be in compliance with applicable standards such as UL 985.

29.10.9.10.7.1 Transmission devices connected to the supervising station sharing on-premises equipment shall be listed as communications or information technology equipment.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 11:37:06 EDT 2019

Committee Statement

Committee Statement: There are devices entering the market that will receive data signals from the panel from a sunsetted technology then transmit these signals over the current cellular network. At minimum, devices need to be listed and tested.

Text has been added requiring transmission devices comply with UL 985 and be listed for its intended application.

Response Message: FR-5098-NFPA 72-2019

Public Input No. 534-NFPA 72-2019 [New Section after 29.10.9.10.6]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5108-NFPA 72-2019 [Section No. 29.11.1.4]

29.11.1.4

The supplier or installing contractor shall provide the system owner or other responsible parties with the following:

- (1) An instruction booklet illustrating typical installation layouts
- (2) Instruction charts describing the operation, method, and frequency of testing and maintenance of the warning equipment
- (3) Printed information for establishing an emergency evacuation plan
- (4) Printed information to inform system owners where they can obtain repair or replacement service, and where and how parts requiring regular replacement, such as batteries or bulbs, can be obtained within 2 weeks
- (5) Information noting both of the following:
 - (6) Unless otherwise recommended by the manufacturer's published instructions, smoke alarms shall be replaced when they fail to respond to tests.
 - (7) Smoke alarms shall not remain in service longer than 10 years from the date of manufacture unless otherwise provided by manufacturer's published instructions.
- (8) The instructions required in 29.14.2 and 29.14.4

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 13:12:43 EDT 2019

Committee Statement

Committee Statement: The text in item (6) is edited to point to the general section on markings and instructions as opposed to specific subsections.

Response Message: FR-5108-NFPA 72-2019

Public Input No. 276-NFPA 72-2019 [Section No. 29.11.1.4]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5110-NFPA 72-2019 [Section No. 29.13.1]

29.13.1

Fire and carbon monoxide alarm equipment shall be maintained and tested in accordance with the manufacturer's published instructions and per the requirements of 14.4.5- and 14.4.6, and 14.4.8.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 14:26:41 EDT 2019

Committee Statement

Committee Statement: Text is added to point to the section on maintenance and testing of household carbon monoxide detection systems.

Response Message: FR-5110-NFPA 72-2019

Public Input No. 308-NFPA 72-2019 [Section No. 29.13.1]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5113-NFPA 72-2019 [Section No. 29.14]

29.14 Markings and Instructions.

29.14.1 ~~Alarms~~ Markings

29.14.1.1 Alarms and Detectors .

All alarms and detectors shall be plainly marked with the following information on the unit:

- (1) Manufacturer's or listee's name, address, and model number
- (2) A mark or certification that the unit has been listed
- (3) Electrical rating (where applicable)
- (4) Manufacturer's published operating and maintenance instructions
- (5) Test instructions
- (6) Replacement and service instructions
- (7) Explanation of signal indicators, including identification of lights, switches, meters, and similar devices, regarding their function, unless their function is obvious
- (8) Distinction between alarm and trouble signals on units employing both
- (9) The sensitivity setting for an alarm having a fixed setting (For an alarm that is intended to be adjusted in the field, the range of sensitivity shall be indicated. The marked sensitivity shall be indicated as a percent per foot obscuration level. The marking shall include a nominal value plus tolerance.)
- (10) Reference to an installation diagram and system owner's manual
- (11) Date of manufacture in the format YEAR (in four digits), MONTH (in letters), and DAY (in two digits) located on the outside of the alarm

29.14.1.1 ~~—~~ .1

Where space limitations prohibit inclusion of 29.14.1.1 (4) and 29.14.1.1 (6), it shall be permitted to include this information in the installation instructions instead.

29.14.1.2 ~~Carbon Monoxide Alarm~~ Alarms and ~~Detector~~ Markings ~~Detectors~~ .

In addition to 29.14.1.1 , carbon monoxide alarms or detectors shall be marked with the following information:

- (1) Statement that indicates the unit is not suitable as a fire detector
- (2) ~~Electrical rating~~ (if applicable)
- (3) Warning that carbon monoxide is odorless, colorless, and tasteless
- (4) Emergency actions to be taken
- (5) Recommended replacement date

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

29.14.1.3 Household Alarm Control Unit Units .

Unless otherwise permitted by 29.14.1.4, all household alarm control units shall be plainly marked with the following information on the unit:

- (1) Manufacturer's or listee's name, address, and model number
- (2) A mark or certification that the unit has been listed
- (3) Electrical rating (where applicable)
- (4) Identification of all user interface components and their functions (such as, but not limited to, lights, switches, and meters) located adjacent to the component
- (5) Manufacturer's published operating and maintenance instructions
- (6) Test instructions
- (7) Replacement and service instructions
- (8) Reference to an installation wiring diagram and homeowner's manual, if not attached to control unit, by drawing number and issue number and/or date

29.14.1.4

Where space limitations prohibit inclusion of 29.14.1.3(5) and 29.14.1.3(7), it shall be permitted to include this information in the installation instructions instead.

29.14.**5—Carbon Monoxide Instructions.****2 Instructions**

~~29.14.2.1 Alarms and Detectors. The following information shall be included in the instructions provided with carbon monoxide alarms and detectors:~~

- ~~(1) Installation instructions~~
- ~~(2) Operating instructions~~
- ~~(3) Testing instructions~~
- ~~(4) Maintenance instructions~~
- ~~(5) Replacement and service instructions~~

29.14.2.2 Carbon Monoxide Alarms and Detectors.

In addition to 29.14.2.1, the following information shall be included in the instructions provided with carbon monoxide alarms and detectors:

- (1) Statement indicating that smoke might not be present during a carbon monoxide alarm condition
- (2) * Information on the actions to be taken in case of an alarm
- (3) Minimum and recommended distances from fuel-burning appliances

Supplemental Information

File Name	Description	Approved
72_HOU_FR-5113_29.14.docx	For staff use. Shows correct numbering	

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 14:49:33 EDT 2019

Committee Statement

Committee Section 29.14 is reorganized for clarity and grouping of like requirements. It also adds

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

Statement:	requirements to provide instructions for non-carbon monoxide alarms and detectors.
Response Message:	FR-5113-NFPA 72-2019

SUBJECT TO REVISION - NOT FOR PUBLICATION

FOR COMMITTEE USE ONLY

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5068-NFPA 72-2019 [Section No. A.29.1.1]

SUBJECT TO REVISION - NOT FOR PUBLICATION

FOR COMMITTEE USE ONLY

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

A.29.1.1

This chapter provides a number of requirements related to fire warning equipment and carbon monoxide warning equipment that are deemed to be the practical and necessary minimum for average conditions at the present state of the art.

Chapter 29 does not attempt to cover all equipment, methods, and requirements that might be necessary or advantageous for the protection of lives and property from fire. *NFPA 72* is a “minimum code.” This chapter provides a number of requirements related to single- and multiple-station alarms and household fire alarm systems that are deemed to be the practical and necessary minimum for average conditions at the present state of the art. *Currently Available Smoke Alarm Technology.* The technologies used in currently available smoke alarms

Smoke alarms in compliance with the 8th edition of UL 217 and the 7th edition of UL 268 have passed a new performance test to help reduce nuisance alarms from normal cooking. This end product performance and listing requirement align with Section 29.11.3.4(6) of this Code. Smoke alarms complying with these UL standards will be listed “for resistance to common nuisance sources from cooking” and are suitable for installation at distances from cooking appliances outlined in this Code.

The technologies used in smoke alarms and detectors manufactured prior to the effective date of the new standards include ionization smoke detection and photoelectric smoke detection. These detection types are defined in 3.3.276.2 and 3.3.276.4 and are further explained in A.3.3.276.2 and A.3.3.276.4. Ionization smoke detection is more responsive to invisible particles produced by most flaming fires. Photoelectric smoke detection is more responsive to the visible particles produced by most smoldering fire.

Residential smoke alarms and commercial smoke detectors are currently available with either ionization technology or photoelectric technology or a combination of both technologies. The use of both technologies generally offers the advantage of providing a faster response to both flaming and smoldering fires, and is recommended for those who desire a higher level of protection than the minimum requirements of this Code.

Fatal home fires involving smoldering fires and flaming fires occur at night and during the day. It is not possible to reliably predict what type of fire will occur or at what hour of the day it will occur. Therefore, the preference of one technology over the other on the basis of the expectation of a particular type of fire (predominately smoldering or flaming) is not a sound basis for selection. While the current consensus of experts suggests that neither technology offers an advantage when the fire type is not known, there is a consensus that there would be a benefit to having both technologies since the type of fire cannot be predicted.

Based on recent analysis of the full scale fire tests documented by the National Institute of Standards and Technology in Report TN 1455-1-2008, *Performance of Home Smoke Alarms, Analysis of the Response of Several Available Technologies in Residential Fire Settings*, the minimum provisions of the Code using either technology are considered to provide an adequate level of protection for most individuals who are not intimate with the fire and are capable of self rescue. This would include occupants in the room of fire origin for both flaming and smoldering fires who escape through the normal path of egress. Protection beyond the minimum provisions of the Code using both technologies should be considered for situations involving individuals who are not capable of self rescue or who might need additional time for escape. These situations might include families where extra time is needed to awaken or assist others.

While it is true that ionization detection technology is more susceptible to nuisance alarms due to cooking, the use of this technology should not be dismissed, particularly where the additional protection of both technologies is suggested. In addition, there is no substantial evidence that suggests that either technology is more susceptible to nuisance alarms from bathroom steam. Provisions and guidance have been added to 29.11.3.4 to help minimize nuisance alarms from both sources. This is important since smoke alarms that are disabled due to frequent nuisance alarms offer no protection whatsoever. A higher level of protection would be afforded by using both technologies in all locations required by this Code with additional locations in other rooms of the dwelling. In considering this, pending the availability of smoke alarms specifically designed for nuisance alarm immunity, additional locations within 20 ft of a cooking appliance should be minimized, especially for smoke alarms using ionization technology.

While these considerations reflect the consensus of experts based on currently available test data that allows analysis of tenability along with alarm response, full scale fire testing and nuisance alarm testing of current technologies has continued and analysis of this data will also continue. In addition, new technologies are being considered with the prospect of enhanced detection response along with a higher immunity to nuisance activations. The work of the industry and the NFPA technical committee responsible for smoke alarm provisions will be ongoing.

Submitter Information Verification

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

Committee: SIG-HOU

Submittal Date: Tue Jul 23 08:47:56 EDT 2019

Committee Statement

Committee Statement: A detailed description of smoke alarm technology will not be necessary for the new devices, however, legacy products will continue to exist for some period of time which is why this information should remain for the next code cycle.

The reference should be to "fire warning equipment and carbon monoxide warning equipment."

Response Message: FR-5068-NFPA 72-2019

[Public Input No. 283-NFPA 72-2019 \[Section No. A.29.1.1\]](#)

[Public Input No. 588-NFPA 72-2019 \[Section No. A.29.1.1\]](#)

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5125-NFPA 72-2019 [Section No. A.29.1.4]

A.29.1.4

Installations in manufactured homes are under the jurisdiction of The Department of Housing and Urban Development (HUD). The rules for installation are addressed in the Federal Manufactured Housing Construction Safety Standards (available at <https://www.hud.gov/offices/hsg/sfh/mhs/mhshome.cfm>).

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 16:42:09 EDT 2019

Committee Statement

Committee Statement: The text is updated to the correct link.

Response Message: FR-5125-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5073-NFPA 72-2019 [Section No. A.29.3.3]

A.29.3.3

This Code establishes minimum standards for the use of fire-warning equipment. The use of additional alarms or detectors over and above the minimum standard is encouraged. The use of additional devices can result in a combination of equipment (e.g., a combination of single- and multiple-station alarms or a combination of smoke alarms or smoke detectors that are part of a security/fire system and existing multiple-station alarms). Though a combination is allowed, one type of equipment must independently meet the requirements of the Code. Compliance with the requirements of the Code cannot rely on the combination of the following fire-warning equipment:

- (1) Single-station alarms
- (2) Multiple-station alarms
- (3) Household fire alarm system (includes a security/fire system with smoke alarms or smoke detectors)

It is encouraged that the highest level of protection be used where possible. For example, if multiple-station alarms are added to an occupancy with compliant single-station alarms, the multiple-station alarms should be installed to replace all of the single-station alarms. Similarly, if a monitored household fire alarm system is added to a house that has compliant multiple-station alarms, monitored smoke alarms or smoke detectors should be installed to replace the multiple-station alarms or be installed to provide the same required coverage.

The responsiveness of ionization- and photoelectric-type smoke alarms depends on a number of factors, including the type of fire (smoldering, flaming), the chemistry of materials involved in the fire, and the properties of the resulting smoke. Several fire safety organizations recommend that a consumer utilize both ionization and photoelectric technologies in their home smoke alarm systems to permit the longest potential escape times for nonspecific fire situations. This will not preclude the development of new technology with equivalent performance.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 09:00:19 EDT 2019

Committee Statement

Committee Statement: In response to the new requirements in UL 217 (8th edition) and UL 268 (7th edition), the text has been deleted. The information has been incorporated into A.29.1.1 (FR-5068).

Response Message: FR-5073-NFPA 72-2019

Public Input No. 589-NFPA 72-2019 [Section No. A.29.3.3]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5009-NFPA 72-2019 [Section No. A.29.5.3]

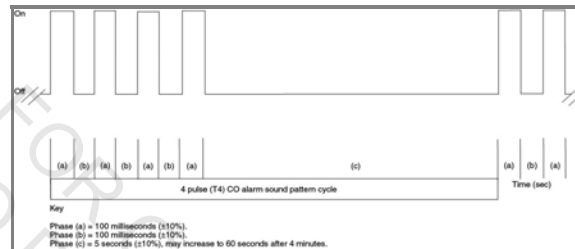
MAKE SURE #'s line up with reorg of 29.5.

Replace the text of the figure to read as follows: Phase (c) = 5 seconds $\pm 10\%$, should be permitted to increase to 60 seconds ($\pm 10\%$) after 4 minutes.

A.29.5.3

The four pulse temporal (T-4) pattern is illustrated in Figure A.29.5.3.

Figure A.29.5.3 Four Pulse Temporal Pattern.



Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Jul 22 09:45:22 EDT 2019

Committee Statement

Committee Statement: The section number is revised to correspond to the correct section in the body of the standard that relates to the four-pulse (T-4) temporal pattern. The text in the figure was revised to follow the NFPA Manual of Style and to correlate with the product standard (UL 2034).

Response Message: FR-5009-NFPA 72-2019

Public Input No. 275-NFPA 72-2019 [Section No. A.29.5.3]

Public Input No. 289-NFPA 72-2019 [Section No. A.29.5.3]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5129-NFPA 72-2019 [Section No. A.29.5.5]

REVISE THE TITLES OF THE FIGURES AS INDICATED:

Figure A.29.5.5 (a) Temporal Pattern Parameters with eight T3 cycles minimum with 10-Second Voice Allowance

Figure A.29.5.5(c) Temporal Pattern Parameters with 10-Second Voice Allowance in any T3 cycle

Figure A.29.5.6.a) Temporal Pattern Parameters with six T4 cycles with 10-Second Voice Allowance

Figure A.29.5.6(c) Temporal Pattern Parameters with 10-Second Voice Allowance in any T4 cycle

Figure A.29.5.5(b) T3 Temporal Pattern Parameters with 1.5-Second Voice Allowance

Figure A.29.5.6(b) T4 Temporal Pattern Parameters with 1.5-Second Voice Allowance

A.29.5.5

It is recommended that the voice notification message be intelligible, audible, and appropriate for the hazard. Care should be taken to avoid excessive silence during the message. Figure A.29.5.5(a) through Figure A.29.5.5(c) provide examples of acceptable combinations of the emergency evacuation signal and voice messages.

Figure A.29.5.5(a) Temporal Pattern Parameters with 10-Second Voice Allowance.

Alarm initiation — eight T3 cycles minimum								Two T3 cycles minimum — repeat as desired	
T3 cycle	T3 cycle	T3 cycle	T3 cycle	T3 cycle	T3 cycle	T3 cycle	T3 cycle	Voice — 10-sec maximum	T3 cycle
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(1) (2)

Figure A.29.5.5(b) Temporal Pattern Parameters with 1.5-Second Voice Allowance.

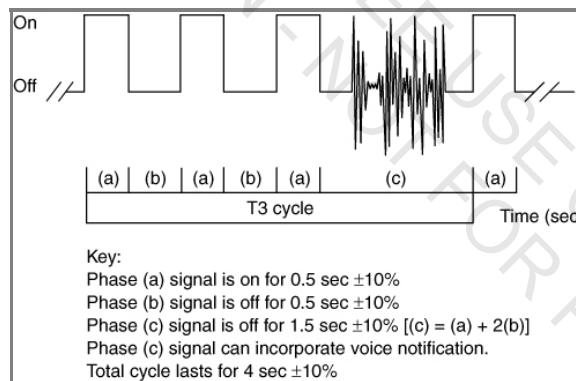


Figure A.29.5.5(c) Temporal Pattern Parameters with 10-Second Voice Allowance.

Alarm initiation — eight T3 cycles minimum. Optional voice allowed in any T3 cycle.								Two T3 cycles minimum — repeat as desired.	
T3 cycle with voice	T3 cycle with voice	T3 cycle with voice	T3 cycle with voice	T3 cycle with voice	T3 cycle with voice	T3 cycle with voice	T3 cycle with voice	Voice — 10-sec maximum	T3 cycle with voice
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(1) (2)

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 17:05:42 EDT 2019

Committee Statement

Committee Statement: The captions are revised to better identify each figure.

Response Message: FR-5129-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5049-NFPA 72-2019 [Section No. A.29.8.1.1(2)]

A.29.8.1.1(2)

The term *dwelling unit* is defined in 3.3.83 and applies to one- and two-family dwellings and dwelling units of apartment buildings (including condominiums). The distance referenced for the location of the required smoke alarm should be measured on a horizontal projection of the ceiling and along the path of egress travel by an occupant.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Jul 22 15:51:28 EDT 2019

Committee Statement

Committee Statement: The term "path of travel" in 29.8.1.1(2) may have caused confusion and clarification of the term is added to the annex. This explanation follows the requirements of 17.7.3.2.4.5(3).

Response Message: FR-5049-NFPA 72-2019

Public Input No. 281-NFPA 72-2019 [Section No. A.29.8.1.1(2)]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5045-NFPA 72-2019 [Section No. A.29.8.1.3.1]

A.29.8.1.3.1

The distance referenced for the spacing of smoke alarms should be measured on a horizontal projection of the ceiling. One smoke alarm per 500 ft² (46 m²) is evaluated by dividing the total interior square footage of floor area per level by 500 ft² (46 m²). The requirements do not preclude the installation of smoke alarms on walls in accordance with 29.11.3.3. Some building configurations, such as division of rooms and open foyers or great rooms, dictate that alarms be located so that they do not cover distinctly separate 500 ft² (46 m²) areas but rather provide overlapping coverage relative to this spacing requirement.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Jul 22 15:44:19 EDT 2019

Committee Statement

Committee Statement: The term "travel distance" in 29.8.1.3.1 may have caused confusion and clarification of the term is added to the annex. This explanation follows the requirements of 17.7.3.2.4.5(3).

Response Message: FR-5045-NFPA 72-2019

Public Input No. 282-NFPA 72-2019 [Section No. A.29.8.1.3.1]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5132-NFPA 72-2019 [Section No. A.29.8.2.1.1]

A.29.8.2.1.1

As of the 2007 edition of *NFPA 72*, the Code required the interconnection of alarms for both new and existing construction. The introduction of wireless interconnect smoke alarms allows installation of interconnect devices in existing construction without the need for ac wiring modifications that once were required to retrofit interconnected alarms. Work by the U.S. Consumer Product Safety Commission (CPSC) has concluded that interconnection of alarms is an important factor that can affect proper notification and life safety [1, 2]. The CPSC study shows that interconnected smoke alarms alerted residents to the fire more than twice as often as noninterconnected alarms. A Victoria University study [3] also emphasizes the need for interconnected alarms. The study indicates that interconnected smoke alarms in every room in every dwelling would lead to about 50 percent fewer fatalities. ~~A study by Underwriters Laboratories shows the benefit of interconnection [4].~~

- (1) Green, M. A., and Andres, C. "2004-2005 National Sample Survey of Unreported Residential Fires." CPSC, 2009.
- (2) Ahrens, M. "Factors in Smoke Alarm Performance." National Fire Protection Association. December 2009.
- (3) Thomas, I., and Bruck, D. "Smoke Alarms in Dwellings: Timely Activation and Effective Notification." Victoria University. June 2010.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Tue Jul 23 17:32:34 EDT 2019

Committee Statement

Committee Statement: The reference to the UL study has been deleted since it could not be confirmed that the study was published.

Response Message: FR-5132-NFPA 72-2019

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5030-NFPA 72-2019 [Section No. A.29.11.3.4(4)]

SUBJECT TO REVISION - NOT FOR PUBLICATION

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

A.29.11.3.4(4)

SUBJECT TO REVISION - NOT FOR PUBLICATION

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

As per annex material located in A.29.8.1, it is not normally recommended that smoke alarms or smoke detectors be placed in kitchen spaces. This section of the code provides guidelines for safe installation if a need exists to install a smoke alarm or smoke detector in a residential kitchen space or cooking area.

Within this Code section, a fixed cooking appliance is any appliance that is intended to be permanently connected electrically to the wiring system or the fuel source. A stationary cooking appliance is any appliance that is intended to be fastened in place or located in a dedicated space, and is connected to the supply circuit or fuel source.

Smoke alarms and smoke detectors that are currently available to consumers are susceptible to particles released into the air during normal cooking procedures. If smoke alarms and smoke detectors are placed too close to the area where the cooking source originates, a high level of nuisance alarms can occur. Frequent nuisance alarms can result in an occupant disabling the smoke alarm or smoke detector.

Nuisance alarm studies show that commercially available residential smoke alarms and smoke detectors are susceptible to nuisance alarms when installed too close to cooking appliances. As the horizontal distance between the smoke alarm or smoke detectors and the cooking appliance increases, the frequency of nuisance alarms decreases. Smoke alarms or smoke detectors that use ionization smoke detection have been shown to be more susceptible to cooking nuisance alarms than those that use photoelectric smoke detection when the alarms or detectors are installed within 10 ft (3.0 m) along a horizontal smoke travel path from a cooking appliance. Smoke alarms or smoke detectors that use photoelectric smoke detection produce nuisance alarms when installed less than 10 ft (3.0 m) from a cooking appliance, though to a lesser degree.

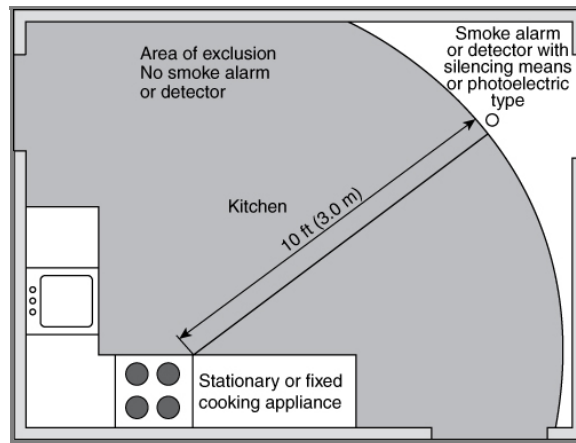
The occurrence of the higher frequency of nuisance alarms observed in smoke alarms or smoke detectors that use ionization detection have been documented in the fire research data. Due to the differences in technology between ionization detection and photoelectric detection, the sensitivity typically used for ionization detection is much higher than that used for photoelectric detection. This sensitivity difference is a result of each type of the detection being required to satisfy UL 217 performance tests. Removing detection technology from consideration, the frequency of nuisance alarms is solely due to the sensitivity of the detection method used. Thus, both ionization and photoelectric detector technologies will produce nuisance alarms due to cooking, but currently available smoke alarms and smoke detectors that use ionization detection typically produce more cooking-related nuisance alarms.

The higher sensitivities of currently available smoke alarms and smoke detectors that use ionization detection do provide a benefit at the expense of a potentially higher rate of cooking-related nuisance alarms. Research has demonstrated that ionization detection will typically respond faster than photoelectric detection to flaming fires, providing earlier warning to occupants that might allow for quicker intervention or faster egress. In general, the installation of smoke alarms or smoke detectors that use ionization detection will result in increased fire safety at the risk of a higher frequency of nuisance alarms. The installation of smoke alarms or smoke detectors that use photoelectric detection will result in reduced fire safety for flaming fires and a reduced risk of nuisance alarms. Based on the trade-off between faster response to fires and the frequency of nuisance alarms, detectors that utilize both technologies (i.e., ionization, photoelectric, and a combination) are allowed to be installed between 10 ft (3.0 m) and 20 ft (6.1 m) along a horizontal flow path from a standard or fixed cooking appliance if the specific detector is equipped with an alarm silencing means or is of the photoelectric-type.

Nuisance alarm studies provide data on cooking nuisances that emanate from both fixed cooking appliances and stationary cooking appliances (e.g., stove, oven) as well as portable cooking appliances (e.g., toaster). Based on these studies, which demonstrate the potential of all cooking appliances to generate nuisance sources, a zone of exclusion has been specified surrounding each stationary or fixed cooking appliance. The purpose of this zone is to limit the installation of smoke alarms and detectors in areas where stationary, fixed, or portable cooking appliances will be located within the residential kitchen space such that potential nuisance alarms are minimized. The size of the zone of exclusion is specified to attempt to take into account the unknown and transitory locations of portable cooking appliances. This zone of exclusion is determined by measuring a 10 ft (3.0 m) radial distance from the closest edge of a stationary or fixed cooking appliance. The zone of exclusion is not intended to pass through walls or doorways. Figure A.29.11.3.4(4)(a) provides an example of the zone of exclusion in a generalized residential kitchen.

Figure A.29.11.3.4(4)(a) Example of Zone of Exclusion (gray area) Within Typical Residential Kitchen.

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



If other areas of this code require that a smoke alarm or smoke detector be placed within a horizontal flow path distance between 10 ft (3.0 m) and 20 ft (6.1 m) from a stationary or fixed cooking appliance, the following method should be used to determine the distance, and only photoelectric detection or smoke alarms/detectors with alarm silencing means can be installed in this area.

To install a smoke alarm or detector between 10 ft (3.0 m) and 20 ft (6.1 m) from the cooking appliance, an installer must first determine the 10 ft (3.0 m) area of exclusion. Once the area of exclusion is determined, an installer must then determine the horizontal flow distance. This is the horizontal distance along the ceiling from the closest edge of the cooking appliance to the smoke alarm or detector. The horizontal distance can consist of line segments due to impediments, such as interior partitions. Once an impediment is met, the measurement of the distance will then continue along the new horizontal path segment until the distance requirement is met or another impediment is encountered. Figure A.29.11.3.4(4)(b) provides an example for placement outside a kitchen in a nearby hallway. Figure A.29.11.3.4(4)(c) provides another example of appropriate placement outside of a kitchen in an adjacent room.

Figure A.29.11.3.4(4)(b) Example of Smoke Alarm or Smoke Detector Placement Between 10 ft (3.0 m) and 20 ft (6.1 m) Away in Hallway from Center of Stationary or Fixed Cooking Appliance.

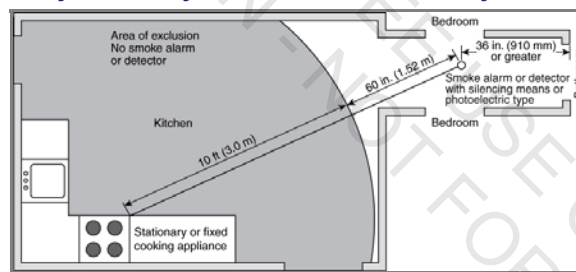
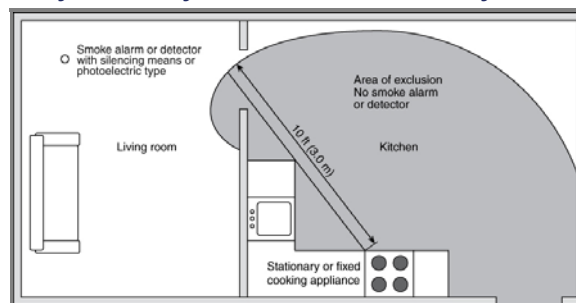


Figure A.29.11.3.4(4)(c) Example of Smoke Alarm or Smoke Detector Placement Between 10 ft (3.0 m) and 20 ft (6.1 m) Away in Hallway from Center of Stationary or Fixed Cooking Appliance.



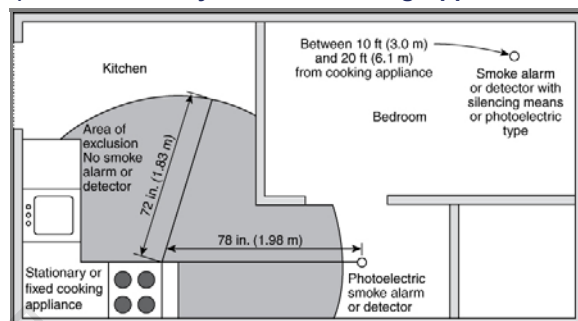
At a horizontal flow path distance of greater than 20 ft (6.1 m), any type of smoke alarm or smoke detector can be installed.

In rare cases, a residential dwelling can be of such size and configuration that an area of exclusion of 10 ft (3.0 m) from a stationary or fixed cooking appliance excludes the placement of a smoke alarm or smoke detector required by other areas of this Code. In these cases, a smoke alarm or smoke detector using photoelectric detection can be installed at least 72 in. (1.83 m) from the fixed or stationary cooking appliance. Figure A.29.11.3.4(4)(d) provides an example of this situation in practice where a smoke alarm or smoke detector is required outside of the sleeping area, but the space is in close proximity to the kitchen space.

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication

In response to the above noted nuisance alarm studies, the 8th edition of UL 217 and the 7th edition of UL 268 have added a new performance test to help reduce nuisance alarms from normal cooking. This end product performance and listing requirement align with Section 29.11.3.4(6) of this Code. Smoke alarms complying with these UL standards will be Listed "for resistance to common nuisance sources from cooking" and are suitable for installation at distances from cooking appliances outlined in this Code.

Figure A.29.11.3.4(4)(d) Example of Exception Placement of Photoelectric Smoke Alarm or Smoke Detector at 72 in. (1.83 m) from Stationary or Fixed Cooking Appliance.



Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Jul 22 13:42:50 EDT 2019

Committee Statement

Committee Statement: The last paragraph has been added to address alarms listed to the new UL nuisance test. During the transition to new editions of UL 217 and UL 268 guidance on existing technologies is still valid and remains in this Code.

Response Message: FR-5030-NFPA 72-2019

Public Input No. 590-NFPA 72-2019 [Section No. A.29.11.3.4(4)]

WORKING DRAFT OF COMMITTEE MEETING OUTPUT - NFPA 72 - July 2019
Subject to Revision - Not for Publication



First Revision No. 5037-NFPA 72-2019 [Section No. A.29.11.3.4(7)]

A.29.11.3.4(7)

Studies indicate that smoke alarms and smoke detectors that use ionization detection, photoelectric detection, or a combination of ionization and photoelectric detection, are susceptible to nuisance alarms caused by steam. ~~Little~~ Some research has been done on the comparative response of these types of detection to steam. Steam particles, in general, are visible, reflect light easily, and are typically produced in a size range that would ~~has been shown to~~ be more likely to actuate a photoelectric sensor (Dinaburg and Gottuk, 2015). Thus, it is required that smoke alarms and smoke detectors be installed greater than 36 in. (910 mm) from the bathroom door where possible. Increasing the distance between the smoke alarm or smoke detector and the bathroom door can reduce the frequency of nuisance alarms from bathroom steam. Frequent nuisance alarms can result in the occupant disabling the smoke alarm. Each incremental increase in separation, up to 10 ft (3.0 m), between the bathroom door and the smoke alarm or smoke detector is expected to reduce the frequency of nuisance alarms.

Submitter Information Verification

Committee: SIG-HOU

Submittal Date: Mon Jul 22 14:24:42 EDT 2019

Committee Statement

Committee Statement: More recent studies have shown photoelectric sensors are more sensitive to steam. This section has been amended to reflect that research.

Response Message: FR-5037-NFPA 72-2019

Public Input No. 592-NFPA 72-2019 [Section No. A.29.11.3.4(7)]