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flame spread index of 25 or less and a smoke developed index of 450 or less.

(c) *Attic locations.* Exposed insulation installed on the floor or ceiling forming the lower boundary of the attic must be tested in accordance with NFPA 253-2000, Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source (incorporated by reference, see §3280.4) and must have a critical radiant flux of not less than 0.12 watt/cm².

§ 3280.208 Requirements for foam plastic thermal insulating materials.

(a) *General.* Foam plastic thermal insulating materials shall not be used within the cavity of walls (not including doors) or ceilings or be exposed to the interior of the home unless:

(1) The foam plastic insulating material is protected by an interior finish of 5/16-inch thick gypsum board or equivalent material for all cavities where the material is to be installed; or

(2) The foam plastic is used as a sheathing or siding backerboard, and it:

(i) Has a flame spread rating of 75 or less and a smoke-developed rating of 450 or less (not including outer covering of sheathing);

(ii) Does not exceed 3/8-inch in thickness; and

(iii) Is separated from the interior of the manufactured home by a minimum of 2 inches of mineral fiber insulation or an equivalent thermal barrier; or

(3) The foam plastic insulating material has been previously accepted by the Department for use in wall and/or ceiling cavities of manufactured homes, and it is installed in accordance with any restrictions imposed at the time of that acceptance; or

(4) The foam plastic insulating material has been tested as required for its location in wall and/or ceiling cavities in accordance with testing procedures described in the Illinois Institute of Technology Research Institute (IIT) Report, "Development of Mobile Home Fire Test Methods to Judge the Fire-Safe Performance of Foam Plastic Sheathing and Cavity Insulation, IITRI Fire and Safety Research Project J-6461, 1979" or other full-scale fire tests accepted by HUD, and it is installed in

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a manner consistent with the way the material was installed in the foam plastic test module. The materials must be capable of meeting the following acceptance criteria required for their location:

(i) *Wall assemblies.* The foam plastic system shall demonstrate equivalent or superior performance to the control module as determined by:

(A) Time to reach flashover (600 °C in the upper part of the room);

(B) Time to reach an oxygen (O₂) level of 14% (rate of O₂ depletion), a carbon monoxide (CO) level of 1%, a carbon dioxide (CO₂) level of 6%, and a smoke level of 0.26 optical density/meter measured at 5 feet high in the doorway; and

(C) Rate of change concentration for O₂, CO, CO₂ and smoke measured 3 inches below the top of the doorway.

(ii) *Ceiling assemblies.* A minimum of three valid tests of the foam plastic system and one valid test of the control module shall be evaluated to determine if the foam plastic system demonstrates equivalent or superior performance to the control module. Individual factors to be evaluated include intensity of cavity fire (temperature-time) and post-test damage.

(iii) *Post-test damage assessment for wall and ceiling assemblies.* The overall performance of each total system shall also be evaluated in determining the acceptability of a particular foam plastic insulating material.

(b) All foam plastic thermal insulating materials used in manufactured housing shall have a flame spread rating of 75 or less (not including outer covering or sheathing) and a maximum smoke-developed rating of 450.

[49 FR 32008, Aug. 9, 1984, as amended at 70 FR 72043, Nov. 30, 2005. Redesignated at 78 FR 73982, Dec. 9, 2013]

§ 3280.209 Smoke alarm requirements.

(a) *Labeling.* Each smoke alarm required under paragraph (b) of this section must conform with the requirements of UL 217 (incorporated by reference, see §3280.4), or ANSI/UL 268 (incorporated by reference, see §3280.4), and must bear a label to evidence conformance. Combination smoke and carbon monoxide alarms shall be listed

and must bear a label to evidence conformance with UL 217 and ANSI/UL 2034.

(b) *Combination alarms.* Combination smoke and carbon monoxide alarms shall be permitted to be used in lieu of smoke alarms. If installed, such alarms must meet location requirements for both smoke alarms and carbon monoxide alarms.

(c) *Required smoke alarm locations.* (1) At least one smoke alarm must be installed in each of the following locations:

(i) To protect both the living area and kitchen space. Manufacturers are encouraged to locate the alarm in the living area remote from the kitchen and cooking appliances. A smoke alarm located within 20 feet horizontally of a cooking appliance must incorporate a temporary silencing feature or be of a photoelectric type.

(ii) In each room designed for sleeping.

(iii) On the ceiling of the upper level near the top or above each stairway, other than a basement stairway, in any multistory home completed in accordance with this part or part 3282 of this chapter. The alarm must be located so that smoke rising in the stairway cannot be prevented from reaching the alarm by an intervening door or obstruction.

(2) For each home designed to be placed over a basement, the manufacturer must provide a smoke alarm for the basement and must install at the factory an electrical junction box for the installation of this smoke alarm and for its interconnection to other smoke alarms required by this section. The instructions for installers and information for homeowners required in paragraph (f) of this section must clearly indicate that a smoke alarm should be installed and is to be located on the basement ceiling near the stairway.

(3) A smoke alarm required under this section must not be placed in a location that impairs its effectiveness or in any of the following locations:

(i) Within 3 feet horizontally from any discharge grille when a home is equipped or designed for future installation of a roof-mounted evaporative cooler or other equipment discharging

conditioned air through a ceiling grille into the living space; and

(ii) In any location or environment that is prohibited by the terms of its listing, except as permitted by this section.

(d) *Mounting requirements.* (1) Except in rooms with peaked sloping or shed sloping ceilings with a slope of more than 1.5/12 or as permitted pursuant to paragraph (e) of this section, smoke alarms must be mounted either:

(i) On the ceiling at least 4 inches from each wall; or

(ii) On a wall with the top of the alarm not less than 4 inches below the ceiling, and not farther from the ceiling than 12 inches or the distance from the ceiling specified in the smoke alarm manufacturer's listing and instructions, whichever is less.

(2) Except as permitted pursuant to paragraph (e) of this section, in rooms with peaked sloping ceilings with a slope of more than 1.5/12, smoke alarms must be mounted on the ceiling within 3 feet, measured horizontally, from the peak of the ceiling; at least 4 inches, measured vertically, below the peak of the ceiling; and at least 4 inches from any projecting structural element.

(3) Except as permitted pursuant to paragraph (e) of this section, in rooms with shed sloping ceilings with a slope of more than 1.5/12, smoke alarms must be mounted on the ceiling within 3 feet, measured horizontally, of the high side of the ceiling, and not closer than 4 inches from any adjoining wall surface and from any projecting structural element.

(e) *Connection to power source.* (1) Each smoke alarm must be powered from:

(i) The electrical system of the home as the primary power source and a battery as a secondary power source; or

(ii) A battery rated for a 10-year life, provided the smoke alarm is listed for use with a 10-year battery.

(2) Each smoke alarm whose primary power source is the home electrical system must be mounted on an electrical outlet box and connected by a permanent wiring method to a general electrical circuit. More than one smoke alarm is permitted to be placed

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on the same electrical circuit. The wiring circuit for the alarm must not include any switches between the over-current protective device and the alarm, and must not be protected by a ground fault circuit interrupter.

(3) Smoke alarms required under this section must be interconnected such that the activation of any one smoke alarm causes the alarm to be triggered in all required smoke alarms in the home.

(f) *Visible and tactile notification appliances.* (1) In addition to the smoke alarms required pursuant to this section, the manufacturer must provide visible and listed tactile notification appliances if these appliances are ordered by the purchaser or retailer before the home enters the first stage of production. These appliances are required to operate from the primary power source, but are not required to operate from a secondary power source.

(2) A visible notification appliance in a room designed for sleeping must have a minimum rating of 177 candela, except that when the visible notification appliance is wall-mounted or suspended more than 24 inches below the ceiling, a minimum rating of 110 candela is permitted.

(3) A visible notification appliance in an area other than a room designed for sleeping must have a minimum rating of 15 candela.

(g) *Testing and maintenance.* (1) Each required smoke alarm installed at the factory must be operationally tested, after conducting the dielectric test specified in § 3280.810(a), in accordance with the alarm manufacturer's instructions. A smoke alarm that does not function as designed during the test and is not fixed so that it functions properly in the next retest must be replaced. Any replacement smoke alarm must be successfully tested in accordance with this paragraph.

(2) Home manufacturers must provide specific written instructions for installers on how to inspect and test the operation of smoke alarms during installation of the home. These instructions must indicate that any smoke alarm that does not meet the inspection or testing requirements needs to be replaced and retested.

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(3) Home manufacturers must provide the homeowner with the alarm manufacturer's information describing the operation, method and frequency of testing, and proper maintenance of the smoke alarm. This information must be provided in same manner and location as the consumer manual required by § 3282.207 of this chapter, but does not have to be incorporated into the consumer manual. No dealer, distributor, construction contractor, or other person shall interfere with the distribution of this information

[67 FR 12817, Mar. 19, 2002, as amended at 67 FR 49795, July 31, 2002. Redesignated at 78 FR 73982, Dec. 9, 2013; 86 FR 2518, Jan. 12, 2021]

§ 3280.210 Fire testing.

All fire testing conducted in accordance with this subpart shall be performed by nationally recognized testing laboratories which have expertise in fire technology. In case of dispute, the Secretary shall determine if a particular agency is qualified to perform such fire tests.

[49 FR 32011, Aug. 9, 1984. Redesignated at 78 FR 73982, Dec. 9, 2013]

§ 3280.211 Carbon monoxide alarm requirements.

(a) *Labeling.* Carbon monoxide alarms shall be listed and must bear a label to evidence conformance with ANSI/UL 2034 (incorporated by reference, see § 3280.4). Combination carbon monoxide and smoke alarms shall be listed and must bear a label to evidence conformance with ANSI/UL 2034 and UL 217 (incorporated by reference, see § 3280.4).

(b) *Required carbon monoxide alarm locations.* Carbon monoxide alarms must be installed in each home containing either a fuel burning appliance or designed by the home manufacturer to include an attached garage. Carbon monoxide alarms must be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms and in accordance with the alarm manufacturer's installation instructions. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm must be installed within the bedroom and in accordance with the manufacturer's installation instructions.