

BUILDING PLANNING FOR SINGLE- AND TWO-FAMILY DWELLINGS

5313.3.3 Heat Detector Interconnection. *The required single heat detector shall be listed for and required to be interconnected to all smoke detectors of the required household fire alarm system, such that the activation of the heat detector will activate all of the audible alarms of the required household fire alarm system throughout the building. The required heat detector is not required to incorporate audible alarm notification nor is any audible notification device required in the garage.*

5313.4 Carbon Monoxide Detectors.

Note: Also refer to 527 CMR 31.00 and 248 CMR as carbon monoxide detector required locations set forth in 527 CMR 31.00 and 248 CMR must also be satisfied

5313.4.1 General. *Carbon monoxide detectors shall either be: listed, interconnected 120V or shall be part of a listed low-voltage combination system or wireless system as defined in NFPA 720.*

5313.4.1.1 Secondary power to CO alarms: *All CO alarms shall have secondary (standby) power supplied from monitored batteries in accordance with NFPA 72. For fire alarm control units (panels), the panel battery shall serve as the source of secondary electrical power. For wireless systems, the panel battery shall serve as the source of secondary electrical power.*

5313.4.2 Carbon Monoxide Detector Listing and Installation Requirements. *All carbon monoxide detectors shall be UL 2034 listed or UL 2075 listed, as applicable, and installed in accordance with the provisions of 780 CMR 51.00 through 99.00, the manufacturer's instructions, the listing criteria, 527 CMR 12.00 and NFPA 720. Required carbon monoxide detectors are not required to be interconnected to the required household fire alarm system but, where interconnection is desired, such carbon monoxide detectors shall be compatible with all interconnected fire detection devices and fire alarms shall have precedence over carbon monoxide alarms.*

5313.4.3 Carbon Monoxide Detector Required Locations. *One carbon monoxide detector shall be installed on each story of a dwelling unit, including basements and cellars (but not including crawl spaces and uninhabitable attics) in accordance with the manufacturer's instructions and the applicable requirements of NFPA 720. When mounting a carbon monoxide alarm on a story with a bedroom, the alarm, at a minimum, shall be located outside the bedroom. A carbon monoxide alarm shall be installed no more than ten ft. outside any bedroom door – these requirements do not alter the fact that all bedrooms must be equipped with smoke detectors/alarms but if a combination appliance*

is utilized, note that for CO only purposes a CO alarm is required no more than ten feet from a bedroom door and outside of the bedroom per 527 CMR 31.00.

5313.4.4 Alarm Intensity. *All alarm-sounding appliances shall have a minimum rating of 85 dBA at ten feet (3048 mm).*

5313.4.5 Maintenance. *It shall be the responsibility of the owner to properly maintain the carbon monoxide detectors in accordance with the manufacturer's instructions and NFPA 720.*

5313.5 Sprinklers.

5313.5.1 Dwellings Requiring Sprinklers. *Automatic sprinklers installed in accordance with NFPA 13D shall be installed in one- and two-family dwellings having an aggregate area greater than 14,400 square feet (1338 m²), including basements but not including garages and unfinished attics.*

5313.5.2 Antifreeze. *Antifreeze shall not be used in sprinkler systems that protect dwelling units, as defined by NFPA 13, NFPA 13R and NFPA 13D. Such sprinkler systems shall be located within the building thermal envelope or otherwise be protected from freezing.*

780 CMR 5314 FOAM PLASTIC

5314.1 General. *The provisions of 780 CMR 5314 shall govern the requirements and uses of foam plastic insulation.*

5314.1.1 Surface Burning Characteristics. *Except where otherwise noted in 780 CMR 5314.2, all foam plastic or foam plastic cores in manufactured assemblies used in building construction shall have a flame-spread rating of not more than 75 and shall have a smoke-developed rating of not more than 450 when tested in the maximum thickness intended for use in accordance with ASTM E 84.*

5314.1.2 Thermal Barrier. *Foam plastic, except where otherwise noted, shall be separated from the interior of a building by minimum ½-inch (12.7 mm) gypsum board or an approved finish material equivalent to a thermal barrier to limit the average temperature rise of the unexposed surface to no more than 250°F (121°C) after 15 minutes of fire exposure to the ASTM E 119 standard time temperature curve. The gypsum board shall be installed using a mechanical fastening system in accordance with 780 CMR 5702.3.5. Reliance on adhesives to ensure that the gypsum board will remain in place when exposed to fire shall be prohibited.*

5314.2 Specific Requirements. *The following requirements shall apply to all uses of foam plastic unless specifically approved in accordance with 780 CMR 5314.3 or by other sections of 780 CMR 51.00 through 99.00.*

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5314.2.1 Masonry or Concrete Construction.

Foam plastics may be used without the thermal barrier described in 780 CMR 5314.1 when the foam plastic is protected by a minimum one-inch (25.4 mm) thickness of masonry or concrete.

5314.2.2 Roofing. Foam plastic may be used in a roof-covering assembly without the thermal barrier when the foam is separated from the interior of the building by wood structural panel sheathing in accordance with 780 CMR 5803, not less than $1\frac{5}{32}$ inch (11.9 mm) in thickness bonded with exterior glue and identified as Exposure 1, with edge supported by blocking or tongue-and-groove joints. The smoke-developed rating shall not be limited.

5314.2.3 Attics and Crawlspace. Within attics and crawl-spaces where entry is made only for service of utilities, foam plastics shall be protected against ignition by $1\frac{1}{2}$ -inch-thick (38 mm) mineral fiber insulation, $\frac{1}{4}$ -inch-thick (6.4 mm) wood structural panels, $\frac{3}{8}$ -inch (9.5 mm) particleboard, $\frac{1}{4}$ -inch (6.4 mm) hardboard, $\frac{3}{8}$ -inch (9.5 mm) gypsum board, or corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm).

5314.2.4 Foam-filled Doors. Foam-filled doors are exempt from the requirements of 780 CMR 5314.1.

5314.2.5 Siding Backer Board. Foam plastic board of not more than $\frac{1}{2}$ -inch (12.7 mm) thickness may be used as siding backer board when separated from interior spaces by not less than two inches (51 mm) of mineral fiber insulation or $\frac{1}{2}$ -inch (12.7 mm) gypsum wallboard or installed over existing exterior wall finish in conjunction with re-siding, providing the plastic board does not have a potential heat of more than 2,000 Btu per square foot (22 720 kJ/m²) when tested in accordance with NFPA 259.

5314.2.6 Interior trim. Foam plastic trim defined as picture molds, chair rails, baseboards, handrails, ceiling beams, door trim and window trim may be installed, provided:

1. The minimum density is 20 pounds per cubic foot (3.14 kg/m³).
2. The maximum thickness of the trim is 0.5 inch (12.7 mm) and the maximum width is four inches (102 mm).
3. The trim constitutes no more than 10% of the area of any wall or ceiling.
4. The flame-spread rating does not exceed 75 when tested per ASTM E 84. The smoke-developed rating is not limited.

5314.2.7 Sill Plates and Headers. Foam plastic shall be permitted to be spray applied to a sill plate and header without thermal barrier subject to all of the following:

1. The maximum thickness of the foam plastic shall be $\frac{3}{4}$ inches (82.6 mm).
2. The density of the foam plastic shall be in the range of 1.5 to 2.0 pcf (24 to 32 kg/m³).
3. The foam plastic shall have a flame spread index of 25 or less and an accompanying smoke developed index of 450 or less when tested in accordance with ASTM E84.

5314.3 Specific Approval. Plastic foam not meeting the requirements of 780 CMR 5314.1 and 5314.2 may be specifically approved on the basis of one of the following approved tests: ASTM E 84, FM 4880, UL 1040, NFPA 286, ASTM E 152, or UL 1715, or fire tests related to actual end-use configurations. The specific approval may be based on the end use, quantity, location and similar considerations where such tests would not be applicable or practical.

5314.4 Interior finish. Foam plastics that are used as interior finish shall also meet the flame-spread requirements for interior finish.

5314.5 Termite damage. The use of foam plastics in areas of "very heavy" termite infestation probability shall be in accordance with 780 CMR 5320.4.

780 CMR 5315 FLAME SPREAD AND SMOKE DENSITY

5315.1 Wall and Ceiling. Wall and ceiling finishes shall have a flame-spread classification of not greater than 200.

Exception: Flame-spread requirements for finishes shall not apply to trim defined as picture molds, chair rails, baseboards and handrails; to doors and windows or their frames; or to materials that are less than $\frac{1}{28}$ inch (0.907 mm) in thickness cemented to the surface of walls or ceilings if these materials have a flame-spread characteristic no greater than paper of this thickness cemented to a noncombustible backing.

5315.2 Smoke-developed Index. Wall and ceiling finishes shall have a smoke-developed index of not greater than 450.

5315.3 Testing. Tests shall be made in accordance with ASTM E 84.

5315.4 Alternate Test Method. As an alternate to having a flame-spread classification of not greater than 200 and a smoke developed index of not greater than 450 when tested in accordance with ASTM E 84, wall and ceiling finishes, other than textiles, shall be permitted to be tested in accordance with NFPA 286. Materials tested in accordance with NFPA 286 shall meet the following criteria:

During the 40 kW exposure, the interior finish shall comply with 780 CMR 5315.4.1. During the 160 kW exposure, the interior finish shall comply