Smoke and Carbon Monoxide Detection in Residential Construction 2015 MSBC Chapter 1309.R314-315

Smoke Alarms: Fire deaths occur in residential buildings more than in any other building type. More than half of all fire deaths in residential buildings occur while the occupants are asleep and are unaware. Death usually results from asphyxiation, long before the fire reaches the occupants. Smoke alarms installed in a home give an early warning of smoke and give the occupants the critical few moments needed to escape. When a smoke alarm sounds, all occupants should immediately vacate the premise and call 911.

Carbon Monoxide Detectors: Carbon monoxide is a colorless, odorless gas generated by combustion processes, such as those found in furnaces and water heaters. Examples of sources of carbon monoxide include temporary heating units, fireplaces, compressors, pumps and other tools and small engines. Excessive exposure to carbon monoxide results in human tissue being deprived of oxygen. Carbon monoxide overexposure may cause chronic effects such as heart damage, or acute effects such as headaches, or, in extreme cases, death by asphyxiation. If a CO alarm sounds in the residence a person should verify that the occupants are not showing signs of CO poisoning (headache, nausea, vomiting, disorientation, etc.). If anyone in the home has symptoms of CO poisoning, call 911 immediately. If no one has symptoms of CO poisoning, open windows or doors to allow fresh air to enter and contact the utility company or appliance repair company as soon as possible.
2015 Minnesota State Building Code Chapter 1309 Section R314 Smoke Alarms & R315 Carbon Monoxide Alarms

This portion of the Minnesota State Building Code includes the requirements for smoke and carbon monoxide alarms in single family, duplex and townhome structures.

The following code excerpt outlines the construction materials and installations that are required for a code compliant emergency escape and rescue opening:

1309 SECTION R314 SMOKE ALARMS

R314.1 Smoke detection and notification. All smoke alarms shall be listed and labeled in accordance with UL 217 and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72.

R314.2 Smoke detection systems. Household fire alarm systems installed in accordance with NFPA 72 that include smoke alarms, or a combination of smoke detector and audible notification device installed as required by this section for smoke alarms, shall be permitted. The household fire alarm system shall provide the same level of smoke detection and alarm as required by this section for smoke alarms. Where a household fire warning system is installed using a combination of smoke detector and audible notification device(s), it shall become a permanent fixture of the occupancy and owned by the homeowner. The system shall be monitored by an approved supervising station and be maintained in accordance with NFPA 72.

Exception: Where smoke alarms are provided meeting the requirements of Section R314.4.

R314.3 Location. Smoke alarms shall be installed in the following locations:
1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

R314.3.1 Alterations, repairs, and additions. An individual dwelling unit shall be equipped with smoke alarms located as required for new dwellings when:

1. Alterations, repairs (including installation or replacement of windows or doors), or additions requiring a permit occur; or
2. One or more sleeping rooms are added or created in existing dwellings.

Exceptions:
1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition of an open porch or deck, or chimney repairs.
2. Installation, alteration, or repairs of plumbing, electrical, or mechanical systems.

R314.4 Power source. Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those
required for overcurrent protection.

Exceptions:
1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.
2. Hard wiring of smoke alarms in existing areas shall not be required where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring without the removal of interior finishes.

R314.5 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception: Interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

1309 SECTION R315 CARBON MONOXIDE ALARMS

R315.1 Carbon monoxide alarms. For new construction, every one-family dwelling unit, two-family dwelling unit, and each townhouse dwelling unit shall have an approved and operational carbon monoxide alarm installed when one of the following conditions occur:
1. Fuel-fired appliances are installed; or
2. Have attached garages.

R315.1.1 Installation. Carbon monoxide alarms shall be installed outside and not more than 10 feet (3048 mm) from each separate sleeping area or bedroom. Alarms shall be installed on each level containing sleeping areas or bedrooms.

R315.2 Carbon monoxide detection systems. Carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliances, installed and maintained in
accordance with this section for carbon monoxide alarms and NFPA 720, shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075. Where a household carbon monoxide detection system is installed, it shall become a permanent fixture of the occupancy, owned by the homeowner and shall be monitored by an approved supervising station.

**Exception:** Where carbon monoxide alarms are installed meeting the requirements of Section R315.1, compliance with Section 315.2 is not required.

**R315.3 Where required in existing dwellings.** Where work requiring a permit occurs in existing dwellings that have attached garages or in existing dwellings within which fuel-fired appliances exist, carbon monoxide alarms shall be provided in accordance with Section R315.1.

**R315.4 Alarm requirements.** Single-station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer’s installation instructions.