




Fiberglass and Mineral Wool Insulation as an Alternative to Sprinkler Systems

Reduce Construction Costs Using Fiberglass and Mineral Wool Insulation to Omit Sprinklers in Concealed Spaces.



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Fire Protection **Requires a Balanced Approach**

There are three basic approaches used in building codes to provide fire safety – detection, suppression, and containment. No single measure guarantees protection in a fire event. Balanced fire protection design blends detection (e.g., fire alarm systems) with active fire suppressions, notably fire sprinklers, and passive measures such as fire-resistive building materials, like fire blocking, firestopping, fire-rated floors, walls, and doors; pressurized stairways; and other compartmentation elements.

Sprinkler systems are an “active” suppression measure because they are activated either mechanically or electronically in the event of a fire.

Active systems typically have moving parts which require maintenance and periodic inspection to assure they will properly function when needed. “Passive” fire protection systems are designed to contain fires, or slow their spread, by means of fire-resistant walls, floors and opening protection, as well as protecting the building from collapsing prematurely due to a fire. Noncombustible insulation materials like fiberglass, and rock and slag wool are commonly used in passive fire protection systems.




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Passive Fire Protection Systems

The North American Insulation Manufacturers Association (NAIMA) strongly supports balanced fire protection, which utilizes integrated safety layers including active protection (such as suppression systems), along with built-in passive fire and smoke protection features, and detection features to facilitate early notification and safe egress. Passive fire protection systems are installed to resist the free passage of flames and smoke to other areas of the building through concealed spaces. Fiberglass, and rock and slag wool insulation materials are ideally suited for this purpose because they are noncombustible

(i.e., contribute minimal fire loading), flexible, and low-cost. These products can easily fill voids and concealed spaces where fire and smoke could otherwise progress through a building. It is important that passive measures remain in place and are repaired or replaced when alterations or maintenance is done on the building.



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in Concealed Spaces and Ceiling Cavities

The National Fire Protection Association NFPA 13 Standard for the Installation of Sprinkler Systems specifies the minimum requirements for the design and installation of automatic sprinkler systems in buildings. Building codes require sprinkler systems in many commercial and residential buildings. NFPA 13 recognizes the use of passive fire protection systems and includes specific provisions which allow sprinklers to be omitted in the concealed spaces of buildings when other specific requirements are met.

Chapter 9 of the 2019 edition of NFPA 13 addresses sprinkler installation requirements in concealed spaces. Section 9.2 entitled Allowable Sprinkler Omission Locations provides several exceptions which permit concealed spaces to omit sprinkler installation. NFPA 13 does not limit the number of stories in a building using this exception, however local building codes may contain limits.

The 2019 version of NFPA 13 contains the following revisions regarding when sprinklers can be omitted.

- The 2019 version consolidated the provisions regarding when sprinklers can be omitted into section 9.2 Allowable Sprinkler Omission Locations.
- The requirement to have the concealed spaces limited to a maximum volume of 160 ft³ was changed so it does not apply to spaces containing standard wood joists but still applies to spaces with composite wood joists. The volume restriction applied to both “spaces within wood joist construction and composite wood joist construction” in the 2016 edition.
- The words “are firestopped” were deleted from section 8.15.2.6 in the 2016 version because firestopping was not an appropriate term for that application. The new section in the 2019 edition is 9.2.1.6.

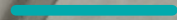
To view the sub-sections of the NFPA 13-2019 that deal specifically with insulated spaces above ceilings, visit:
<https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=13>



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Omitting Sprinklers

in Low-Rise Occupancies and One- and Two-Family Dwellings



NFPA 13R Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies and **NFPA 13D Standard for the Installation of Sprinkler Systems** in One- and Two-Family Dwellings and Manufactured Homes contain similar allowances for omitting sprinklers in some concealed spaces.

NFPA 13D-2019 Low Rise Occupancies

NFPA 13D does not require the following areas to have sprinkler systems:

01.

Attics with or without storage

02.

Penthouse equipment rooms

03.

Elevator machine rooms

04.

Concealed spaces dedicated to and containing dwelling unit ventilation equipment

05.

Floor/ceiling spaces


06.

Elevator shafts

07.

Crawl spaces and other concealed spaces that are not used or intended to be occupied

In areas subject to freezing, NFPA 13D cautions that care should be taken in unheated attic spaces to cover sprinkler piping completely with insulation. Figures have been added to the standard to illustrate the insulation practice using tenting insulation as an acceptable alternative to antifreeze.



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NFPA 13R-2019 - One- and Two-Family Dwellings and Manufactured Homes

Regarding attics, NFPA 13R only requires **attics intended** for occupancy or storage to be sprinklered, but some local building codes require sprinkler protection for all attics. For example, some local building codes require sprinkler protection of all attics in taller, combustible-framed residential occupancies regardless of whether they are intended for occupancy or storage. When these attics are sprinklered they must comply with NFPA 13, or follow the exceptions allowed in the standard. These exceptions include three common practices that allow builders to eliminate the use of sprinklers:

1. Fill the space with noncombustible insulation,
2. Build the space with fire retardant treated wood, or
3. Build the space with noncombustible materials.



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Protecting Sprinkler Piping with Insulation

Because of developments over the past few years regarding the use of antifreeze in residential sprinkler applications, the sprinkler industry developed alternative methods of protecting sprinkler piping in unconditioned areas.

In 2011, the Fire Protection Research Foundation completed a research project titled “Sprinkler Insulation: A Literature Review,” on the use of insulation to protect sprinkler pipes from freezing. Those findings have been incorporated into NFPA 13, NFPA 13D, and NFPA 13R. Refer to those documents for specific details. The report with research findings are available for free download from the NPFA website [here](#).

NFPA 13 and Building Codes

These sprinkler exceptions available for noncombustible insulation in attics should be brought to the attention of your customers and builders since they may receive direct benefits in the way of reduced material and installation costs, by reducing the number of sprinklers that must be installed in certain buildings. Additionally, have the design reviewed and approved by a knowledgeable design professional and local building official. The ICC family of building codes, including the International Residential Code (IRC), International Building Code (IBC), and International Fire Code (IFC), recognize these exceptions and often refer to NFPA Standard 13 within the individual codes.

<https://www.nfpa.org/-/media/Files/Newsand-Research/Resources/Research-Foundation/Research-Foundationreports/Suppression/rfsprinklerinsulation.ashx?la=en>.

This summary is offered for informational purposes only. It does not purport to be an exhaustive analysis of code changes or provide advice that will ensure guaranteed compliance with any energy or fire code provision. Please consult with local authorities before finalizing your installation plans.

*NFPA 13 – 2013 contains an allowance for a 2” air gap between the insulation and the subfloor, prior versions of the standard do not contain this allowance.

Insulation Institute™

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NAIMA (North American Insulation Manufacturers Association) is the recognized voice of the insulation industry, bringing together North American manufacturers of fiberglass and mineral wool insulation products. Through the Insulation Institute™, we leverage the collective insulation expertise of our organization and our members to empower homeowners and professionals to make informed insulation choices. Our mission is to enable a more comfortable, energy efficient and sustainable future through insulation—and we are constantly working with building professionals, homeowners, government agencies, and public interest, energy, and environmental groups to realize that vision.

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