



TechNotes

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#518

08/22/2023

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The Most Common Questions Received by AHJs

It should be noted that the following are the opinions of the NFSA Engineering, Codes, and Standards staff, generated as members of the relevant NFPA (National Fire Protection Association) and ICC (International Code Council) technical committees and through our general experience in writing and interpreting codes and standards. They have not been processed as formal interpretations in accordance with the NFPA Regulations Governing Committee Projects or ICC Council Policy #11 and should therefore not be considered, nor relied upon, as the official positions of the NFSA, NFPA, ICC, or its Committees. Unless otherwise noted the most recently published edition of the standard referenced was used. Authorities having jurisdiction (AHJ) are an important part of NFSA's membership. AHJs are responsible for enforcing, applying, and interpreting the model codes and standards. As such, AHJs have an important role in the NFSA membership community and the fire protection industry. NFSA receives hundreds of questions from AHJs on an annual basis asking for interpretations on codes and standards, which directly impacts the fire sprinkler industry. In this TechNotes, we will discuss some of the most common questions that NFSA receives from code officials and authorities having jurisdiction.

1. Determining Hazard and Commodity Classification

From storage of automobile parts to Ziplock bags, determining the commodity classification is without a doubt one of the most common questions NFSA receives. NFSA staff prides itself on providing the fire protection community with technical information in a timely manner, but more importantly, the information (obviously) needs to be accurate.

Questions regarding hazard or commodity classification are difficult except in those circumstances where an NFPA committee has specifically addressed the issue. This is especially true because the classification is considered in many states to be the most important aspect of fire protection system design, and an obligation of the responsible design professional. One reason many states require involvement of a responsible design professional is to ensure that the site-specific attributes of the project are recognized and properly addressed, which cannot be accomplished in a generic manner.

Since sprinkler protection is based on what is happening in the building and storage criteria is based on the product, the packaging and the type of pallet(s) used, questions dealing with hazard and commodity classification can be challenging for NFSA staff to answer in a specific manner. Unless the hazard or commodity is listed in NFPA 13, NFSA staff will not specifically answer a hazard or commodity classification since that determination is ultimately up to the registered design professional in charge. However, NFSA will try to provide guidance. Refer to TechNotes #516 on Gaps in Sprinkler Rules for additional information on how to address hazard or commodity classifications when not specifically addressed in NFPA 13.

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2. What options are available with ESFR sprinklers when conveyers are used in the building?

The key word in early suppression fast response (ESFR) sprinkler, is the use of the word suppression. To suppress a fire, water must be able to reach the hazard. This is the reason NFPA 13 has specific and strict installation requirements for obstructions when ESFR sprinklers are used. Before the 2022 edition of NFPA 13, there was very little guidance in the standard on how to properly address conveyers in warehouses or how to properly protect under them. This led to differing interpretations and enforcement of inconsistent requirements from one community to the next.

Based on the 2019 edition of NFPA 13, sprinklers were required under any conveyer more than 2 feet wide. The NFPA 13 Technical Committee added a new Section 14.2.11.4 in the 2022 edition specifically addressing conveyers when ESFR sprinklers are used. If high-piled storage is located below the conveyers, ceiling-level sprinklers are necessary. When high-piled storage is not present under the conveyers:

- Quick-response standard spray sprinklers are permitted below conveyers without high-piled storage located underneath.
- Ceiling level sprinklers are not required below conveyers where the conveyer in a horizontal profile is a minimum of 70% open.
- Sprinklers are not required below conveyers up to 4 feet wide.
- Sprinklers are not required below roller conveyers where the horizontal opening between rollers equals or exceeds the width of the roller.
- Additional sprinklers are not required below roller conveyers where the area below the conveyer is void of high-piled storage.

The 2022 edition of NFPA 13 will be referenced in the 2024 editions of the International Building (IBC) and Fire Codes (IFC and NFPA 1), which will be in print this fall. Until that time, many communities will still be following the 2019, or older, editions of NFPA 13. However, authorities having jurisdiction (AHJ) are permitted to approve and accept sections from newer editions using the equivalency criteria in Section 1.5.

3. An existing restaurant (Group A-2) is adding outdoor seating with a canopy for shade adjacent to their building. The building is fully sprinklered and is Type V construction. Does sprinkler protection need to be extended to protect the outdoor seating area?

NFPA 13 is concerned with the potential of a fire starting under an exterior projection and spreading to the interior through openings or penetrations. For this reason, NFPA 13 contains requirements for sprinkler protection under exterior projections in Section 9.2.3 of the 2022 edition of NFPA 13. Sections 9.2.3.1 and 9.2.3.2 will apply to this specific question.

The IBC will also have a say on this issue as well. Specific to this example, the fire area for the Group A-2 occupancy includes the indoor space and the outdoor seating area. It's important to clarify that the building and fire codes often grant exceptions, or tradeoffs, for fully sprinklered buildings. These tradeoffs will no longer apply if fire sprinklers in/under the canopy area are ignored or not provided.

Section 9.2.3.1 says, sprinkler protection may be omitted from under the exterior projection when the projection is constructed of materials that are noncombustible, limited-combustible, or fire-retardant treated wood as defined in NFPA 703, or where the projection is constructed utilizing a noncombustible frame, limited-combustible material, or fire-retardant treated wood with a fabric material that is inherently flame-resistant based on Test Method 2 in NFPA 701. It's important to clarify that fire retardant treated wood must be impregnated with the fire resistive material at time of manufacture. After-market products applied or painted on the wood will not meet NFPA 13 requirements.

Section 9.2.3.2 indicates sprinkler protection may be omitted from below exterior projections of combustible construction, provided the exposed finish material is noncombustible, limited-combustible, or fire-retardant treated wood as defined in NFPA 703, and the exterior projection contains only sprinklered concealed spaces or any of the following unsprinklered combustible concealed spaces:

1. Combustible concealed spaces filled entirely with noncombustible insulation.
2. Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are directly attached to the bottom of solid wood joists to create enclosed joist spaces of 160 cubic feet or less in volume, including space below insulation that is laid directly on top or within the ceiling joists in an otherwise sprinklered attic.
3. Concealed spaces over isolated small exterior projections not exceeding 55 square feet in area.

4. A mixed-use podium style building is being constructed in my jurisdiction with commercial space on the main floor and apartments above. Is NFPA 13R permitted in both buildings?

The answer to this question is found in the 2021 edition of the IBC Section 510.2. This section requires a 3-hour horizontal fire separation between the occupancies used as commercial space and the apartment (residential) occupancy. Condition #6 in Section 510.2 requires the commercial space, or the building below the horizontal assembly, to be protected in accordance with NFPA 13 (Section 903.3.1.1). The residential occupancy above the horizontal assembly is permitted to use NFPA 13R, assuming the conditions outlined in Section 903.3.1.2 are met. That said, NFPA 13R is not permitted throughout both occupancies since IBC Section 510.2 #6 requires the area below the horizontal assembly to be sprinklered in accordance with NFPA 13.



5. Can fire sprinkler pipe be supported from other trades' hangers?

Yes, NFPA 13 does allow fire sprinkler pipe to be hung using hangers from other trades. However, to do so, a registered professional engineer must certify the arrangement as acceptable in accordance with the five conditions in Section 17.1.2 in the 2022 edition of NFPA 13. The five conditions that the registered design professional must consider are:

- The hanger must be able to support five times the weight of the water-filled pipe, plus 250 lbs. at each point of support.
- The points of support must be adequate to support the system piping.
- The spacing between hangers shall not exceed the values outlined in Chapter 17 of NFPA 13.
- The components used to hang the piping must be ferrous.
- Detailed calculations must be submitted to the AHJ for review.

6. We have an ordinary hazard space that has pipe racks in it. The combined width of these pipes on racks is greater than 4 ft. Are the group of pipes together considered an obstruction or should each pipe be treated individually when applying the obstruction criteria? Could you please clarify which is the correct interpretation?

NFPA 13 receives numerous questions on how to apply or interpret the obstruction criteria in NFPA 13. Except for storage applications, NFPA 13 does not address how to handle multiple small obstructions next to each other like what is described in this scenario. The 4-foot obstruction rule would depend on if there are any openings between the pipes to allow water to pass through. If sufficient openings are provided that allow water to pass through, the arrangement is not subjected to the 4-foot obstruction rule. As there is no clear guidance regarding this issue (except for ESFR sprinklers), these situations must be dealt with on a case-by-case basis.

For unique installations such as this, it is recommended the design professional work with the design professional and AHJ to determine proper coverage above, below, or above and below. The goal in the end is to ensure sprinklers are, "positioned and located so as to provide satisfactory performance with respect to activation time and distribution," based on Section 9.1.1 (3) in the 2022 edition of NFPA 13.

7. We are designing a sprinkler system for a new mercantile occupancy (discount goods retail store). Group A plastics will be stored in a dedicated storage room. The landlord made a note that we need to protect all the Group A plastics over 5 feet per code. What's the

decision-making process to determine whether the sprinklers should be designed for mercantile OH2 vs. plastic storage over 5 feet?

NFPA 13 addressed this scenario by adding criteria for miscellaneous storage in Section 4.3.1.4 (Chapter 13 in 2016 edition). It's common for mercantile occupancies to have storage that is ancillary to their primary function. If using the 2019 or 2022 editions of NFPA 13, the answer to this question depends on the storage arrangement, or more specifically, the storage height. NFPA 13 defines high piled storage as "...storage in excess of 12 feet in height". If the storage does not exceed 12 feet, it would fall under low-piled or miscellaneous storage.

It's important to note that NFPA 13 does not require "display" of materials for sale to comply with the "storage" criteria in NFPA 13. If the stockpile of contents exceeds 12 feet in height, the storage criteria and applicable chapters related to storage will apply. That may be the driving factor behind the Group A plastics classification from the landlord. If, however, the storage of product can be kept at 12 feet or below, the ordinary hazard designation would be applicable.

8. there a maximum ceiling height restriction in NFPA 13 to omit sprinklers in a non-storage application? A project has a shell space which is 80 ft tall and we're wondering if sprinklers will be effective at that height.

NFPA 13 does not establish a maximum ceiling height for fire sprinkler protection. Sprinklers can be installed at an elevation of up to 80-ft. There is no building/ceiling height limitation for standard spray sprinklers in NFPA 13. There have been successful tests on 60-ft high ceilings, but the opportunity for testing spaces of that height (or greater) are limited. On occasion, AHJs have permitted the omission of fire sprinklers in areas with high ceilings that have little or no fuel loading where the anticipated fire in that space has been analyzed indicating that the heat produced would not be able to operate the fire sprinklers. However, this is rare. High ceiling areas can be utilized for many different things over the life of the building and sprinklers protect the structure and its contents.

Another consideration is, building codes like the IBC grant many exceptions for "fully" sprinklered buildings. In many cases, fire resistive construction can be reduced or eliminated entirely when the building is equipped throughout with an automatic sprinkler system. If sprinklers are exempted from certain areas, these exceptions may no longer be applicable since the building is no longer "fully" sprinklered in accordance with NFPA 13.

NFSA has written a couple of articles on this subject. Archived versions can be found at www.nfsa.org in the Members Only section.

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9. Does NFPA 13 have any requirements for automatically controlled sprinkler valves that can be controlled from a remote location?

Before the 2019 edition of NFPA 13, control valves that can be controlled from a remote location were not specifically addressed in NFPA 13. Since NFPA 13 was silent on the issue, they were not specifically prohibited. But they were also not specifically allowed in NFPA 13 either. Previous editions (before the 2019 edition) of NFPA 13 simply required control valves to be listed and they must not be able to be closed in less than 5 seconds.

The 2019 edition of NFPA 13 addressed automated control valves in Section 16.9.4. This section was relocated in the 2022 edition to 7.6.2. These sections, along with the related subsections, states (Section 7.6.2.1) that a listed automated water control valve assembly with a reliable position indicator connected to a remote supervisory station is permitted, and (Section 7.6.2.2) that the automated water control valve must be capable of being operated manually at the premises, as well as automatically.

It's important to point out that currently there are no listing criteria for automated control valves. Therefore, none of the valves currently on the market are listed, therefore, they do not comply with Section 7.6.2.1.

10. I found an intermediate temperature sprinkler (175-200°F) in an area classified as Light Hazard. Does NFPA 13 require ordinary temperature rated sprinklers in light hazard, or can intermediate temperature be used?

Yes, intermediate temperature sprinklers (such as the 200°F sprinkler) are permitted to be used in a light hazard space. Section 9.4.2.1 of NFPA 13, 2022 edition, states: "Unless the requirements of [the following four sections] are met, ordinary- and intermediate-temperature sprinklers shall be used throughout buildings."

NFPA 13 allows ordinary-temperature sprinklers through a building, intermediate temperature sprinklers throughout a building, or a mix of ordinary-and intermediate-temperature sprinklers throughout a building.

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Our next Tech Tuesday will be September 19, 2023 from 12:30 pm to 1:30 pm eastern time. The topic will be Common Questions from AHJs.

NFSA's Expert of the Day (EOD) program answers questions from contractors, designers, and code officials daily. This seminar will address the common EOD questions received from authorities having jurisdiction that NFSA receives regarding the codes (IBC, IFC, NFPA 1, NFPA 101) and the standards (NFPA 13, NFPA 14, NFPA 20, etc.).

Member Cost: Free

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**NFSA now uses Adobe Connect for Tech Tuesdays. The link to the virtual classroom will be included in your confirmation and reminder emails. When entering the virtual classroom, log on using your NFSA username and password. All participants must be individually registered and must individually access the class to receive credit. You may find it easier to access the meeting if you download Adobe Connect.

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