

Corrections from Issue 260 (February 26, 2013)

A few people noticed (and commented on) the two typos that appeared in the summary of Changes to NFPA 13 Discharge Criteria in issue #260 that was sent out on February 26, 2013. The first typo was in the title of High Volume Low Speed (HVLS) fans. We reversed a couple of the words by accident.

The second typo was in the change to section 17.2.1.4, which we reported to be on exposed expanded plastics. Actually, the committee had written requirements for protecting exposed unexpanded plastics. We forgot to include the "un". The full section should have read:

Exposed Unexpanded Plastics on Racks (17.2.1.4). A set of rules were put into the standard for protection of exposed unexpanded plastics on racks for storage up to 25 ft in height in buildings up to 35 ft high. The protection includes rules for single row racks, double row racks, and multiple row racks.

Changes in the 2013 Editions of NFPA 13D and NFPA 13R Discharge Criteria

In the January 29, 2013 and February 26, 2013 issues of e-TechNotes, we discussed the changes to the new (2013) edition of NFPA 13. In this issue of e-TechNotes we will discuss what is new in the 2013 editions of NFPA 13R and NFPA 13D. This summary will explain the changes that are most important in the opinion of the editor. This will not be a list of every change to the standard, but is intended to help everyone understand the big issues. The following items were changed:

NFPA 13D

Premixed Antifreeze Solution Definition (3.3.6) - A new definition was inserted so that the requirement to use premixed solutions (see 9.2.2) would be better understood. A premixed antifreeze solution is, "A mixture of an antifreeze material with water that is prepared and factory-mixed by the manufacturer with a quality control procedure in place that ensures that the antifreeze solution remains homogeneous and that the concentration is as specified."

Shadow Area Definition (3.3.9) - The shadow area is defined as, "The dry floor area within the protection area of a sprinkler created by the portion of sprinkler discharge that is blocked by a wall or partition." It is important to note that shadow area still needs to be within the coverage area of the sprinkler. The shadow area rules of 8.2.5.7 do not give the user permission to allow a space to be beyond the reach of a sprinkler if the obstructing wall or partition was not present.

Passive Purge Sprinkler System Definition (3.3.11.5) - "A type of sprinkler system that serves a single toilet in addition to the fire sprinklers." This becomes important in the use of pipe rated for 130 psi as discussed in sections 5.2.2 and 5.2.5.

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Stand-Alone Sprinkler System Definition (3.3.11.9) - "A sprinkler system where the aboveground pipe serves only fire sprinklers." This becomes important in the use of pipe rated for 130 psi as discussed in sections 5.2.1 and 5.2.5.

PEX Pipe and Fittings (5.2.2 and 5.2.5) - Pipe and fittings rated at 130 psi and 120°F (like PEX) can be used on passive purge systems and multipurpose systems (5.2.2.3 and 5.2.5.3). Nonmetallic pipe and fittings designed to withstand a working pressure of not less than 130 psi at 120°F (like PEX) will be permitted to be used in stand-alone wet pipe sprinkler systems equipped with a listed pressure regulating valve set no higher than 80 psi (5.2.2.4 and 5.2.5.4). If the water supply will not get to 80 psi, then the pressure reducing valve is not required.

Pressure Reducing Valves (7.2.6) - Where a pressure reducing or regulating valve is installed on a stand-alone system, a pressure gage and a test connection with an orifice at least as large as the smallest orifice sprinkler on the system shall be installed downstream of the device. This is intended to deal with two situations: where pipe rated at 130 psi is installed (PEX, see 5.2.2.4) and systems connected to high pressure water mains that have a pressure reducing valve.

Saunas and Steam Rooms (7.5.5 and 7.5.6.3(4)) - Not many homes have saunas and steam rooms, but where such rooms are present, they need to be sprinklered. High temperature quick response sprinklers are generally used in such areas.

Shadow Areas (8.2.5.7) - Shadow areas will be permitted in the protection area of a sprinkler as long as the cumulative dry areas do not exceed 15 sq ft per sprinkler.

Dry-Type Sprinklers (8.2.6) - A minimum distance of the barrel of the dry-type sprinkler needs to be in a heated space. The distance depends on the outside (or cold space) temperature and the temperature at which the heated space will remain. See Table 8.2.6.1(a) for more information.

Fuel-Fired Equipment (8.3.5.1) - In previous editions of the standard, concealed spaces with fuel-fired equipment needed sprinkler protection. But in this latest edition, the requirement has changed. If the space containing the fuel-fired equipment is above the occupied spaces (such as in an unfinished attic), then the concealed space does not need any sprinklers. But if the fuel fired equipment is in a concealed space below occupied portions of the building (such as a crawl space under a floor or a concealed space between floors), or if the fuel fired equipment is in a concealed space next to an occupied space (such as a partially finished attic), then the concealed space needs to be protected with at least a single sprinkler over the fuel-fired equipment.

Antifreeze (9.2.2) - Will allow 48% glycerine and 38% propylene glycol for new systems as long as the solution is premixed. The standard will also allow 50% glycerine and 40% propylene glycol in existing systems. When these existing systems are replaced, they need to be replaced with premixed solutions. This is consistent with the TIA's processed and acted on by Standards Council on August 2012.

Antifreeze Placard (9.2.5) - A placard needs to be placed on the antifreeze system main valve that explains the type and concentration of the antifreeze as well as the volume of the system. Since NFPA 13D applies to both new and existing systems, this should be considered a retroactive requirement for existing systems as well as new ones.

Dry-Pipe and Preaction Systems (9.3) - A number of issues with these types of systems were clarified now that at least one manufacturer has received a listing for residential sprinklers to be used in a dry or preaction system.

Discharge and Hydraulic Calculations (Chapter 10) - The requirements for determining how many sprinklers we should plan for having open in a fire, the



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discharge from those sprinklers, and the method we use to determine if those sprinklers will receive water at the proper pressure were moved to a new Chapter 10.

Two Sprinkler Design Area Valid (10.2.1) - The two-sprinkler design was found to be valid for the following five ceiling situations:

(1) A flat, smooth, horizontal ceiling with no beams up to a maximum of 24 ft above the floor.

(2) A smooth, flat, sloped ceiling with no beams up to a maximum slope of 8 in 12. The highest portion of the ceiling shall not be more than 24 ft above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.

(3) A sloped ceiling with beams up to 14 inches deep with pendent sprinklers under the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 sq ft in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.

(4) A sloped ceiling with beams of any depth with sidewall or pendent sprinklers in each pocket formed by the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 sq ft in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft above the floor.

(5) A flat horizontal beamed ceiling, with a maximum ceiling height of 24 ft, with beams up to 14" deep with pendent sprinklers under the beams. The compartment containing the beamed ceiling shall be a maximum of 600 ft² in area. The highest sprinkler in the compartment shall be above all openings from the compartment into any communicating spaces.

Acceptance Testing (Chapter 11) - The requirements for the few tests that need to be accomplished before turning the system over to the homeowner were consolidated into a single new chapter.

Inspection, Testing and Maintenance (Chapter 12) - The requirements for performing periodic inspection, testing and maintenance were consolidated into a single new chapter at the back of the standard. Many of these requirements had previously been in Chapter 4.

NFPA 13R

Title - The title of NFPA 13R was changed to, "NFPA 13R - Standard for the Installation of Sprinkler Systems in Low Rise Residential Occupancies". This simplifies the title and is not intended as a change in scope. The standard will still be limited to buildings up to and including four stories in height.

Scope (1.1) - While the scope remains at buildings no more than 4 stories in height, an additional provision of keeping the building no more than 60 ft above grade plane was added to clarify the limit to the use of NFPA 13R. This is consistent with the model building codes and their maximum allowable height for certain types of multi-family dwellings.

Shadow Area Definition (3.3.10) - The shadow area is defined as, "The dry floor area within the protection area of a sprinkler created by the portion of sprinkler

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discharge that is blocked by a wall or partition." It is important to note that shadow area still needs to be within the coverage area of the sprinkler. The shadow area rules of 8.2.5.7 do not give the user permission to allow a space to be beyond the reach of a sprinkler if the obstructing wall or partition was not present.

Water Meters and PRV's (5.1.2.1) - Water meters and pressure reducing valves that are combined with the domestic water supply are not required to be listed. This continues the general philosophy of NFPA 13R that whatever is acceptable under the plumbing code is acceptable for a combined fire protection/domestic water service line. It is assumed that if unreliable components are used in the domestic system, it will impair the domestic system and be fixed relatively quickly to avoid complaints about the lack of available water.

Nonmetallic Pipe Compatibility with Steel Coatings, Cutting Oils and Lubricants (5.2.3) - If nonmetallic pipe is going to be used in a system that also has steel pipe that is coated with corrosion inhibitors, the coating needs to be investigated for compatibility with the nonmetallic pipe (5.2.3.2). If nonmetallic pipe is used in a system that also has steel pipe, then cutting oils and lubricants used for the fabrication of the steel have to be compatible with the nonmetallic pipe (5.2.3.4).

Nonmetallic Pipe Compatibility with Fire-Stopping Materials (5.2.3.5)- Where fire-stopping materials are intended for use on nonmetallic piping penetrations, the fire stopping-materials need to be investigated for compatibility with the nonmetallic piping materials.

Antifreeze (5.4.2) - The antifreeze rules were modified to be consistent with NFPA 13. This means that no new antifreeze systems will be allowed unless they use a listed antifreeze product. At this time, we are not aware of listed antifreeze products, so no new antifreeze systems can be installed until a listed antifreeze fluid comes on the market.

Dry-Type Sprinklers (6.2.4) - A minimum distance of the barrel of the dry-type sprinkler needs to be in a heated space. The distance depends on the outside (or cold space) temperature and the temperature at which the heated space will remain. See Table 6.2.4.1(a) for more information.

Shadow Area (6.4.6.3.3) – Consolidated all of the various shadow area rules that were scattered around NFPA 13R into one section with three parts:

1. A cumulative dry area of 15 sq ft per sprinkler is permitted
2. In corridors protected with sidewall sprinklers, shadow areas up to 2 ft deep and 9 ft long are permitted behind the sidewall sprinklers.
3. Small shadow areas up to 18 sq ft are permitted with some limitations on length and depth.

Exterior Decks, Balconies and Patios (6.6.5.1) - While the committee still believes that sprinklers are not necessary for these spaces outside of the building, they recognize that the International Building Code and International Fire Code require sprinklers in these spaces and they do not wish for there to be significant differences between the referenced standard and the building/fire code. So, the requirement for sprinklers to be placed on exterior decks, balconies and patios when there is a roof or deck above has been added to the standard. Likewise, the use of sidewall sprinklers to protect under balconies with open wood joist construction has been allowed as long as the sprinklers are 1 to 6 inches below the joists and not more than 14 inches down from the underside of the deck above.

Sprinkler Location and Position (6.6.8) - A general rule referencing NFPA 13 for anything that NFPA 13R does not cover regarding the location and position of sprinklers was added. This is intended to catch issues that periodically come up in usual situations where NFPA 13R has been silent on an issue, but the issue is covered directly in NFPA 13.

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Interior Stairs (6.6.9) - Sprinklers are required to be installed in interior stairwells outside of dwelling units in accordance with NFPA 13. Within the dwelling units, sprinklers may or may not be required depending on the materials used on the stairs and whether the area under the stairs is blocked off or open to storage.

Four Sprinkler Design (7.1.1.3) - The two-sprinkler design was found to be valid for the following five ceiling situations:

- (1) A flat, smooth, horizontal ceiling with no beams up to a maximum of 24 ft above the floor.
- (2) A smooth, flat, sloped ceiling with no beams up to a maximum slope of 8 in 12. The highest portion of the ceiling shall not be more than 24 ft above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.
- (3) A sloped ceiling with beams up to 14 inches deep with pendent sprinklers under the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 sq ft in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.
- (4) A sloped ceiling with beams of any depth with sidewall or pendent sprinklers in each pocket formed by the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 sq ft in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft above the floor.
- (5) A flat horizontal beamed ceiling, with a maximum ceiling height of 24 ft, with beams up to 14" deep with pendent sprinklers under the beams. The compartment containing the beamed ceiling shall be a maximum of 600 ft² in area. The highest sprinkler in the compartment shall be above all openings from the compartment into any communicating spaces.

Design Criteria Outside the Dwelling Unit (7.2.4) - Where quick response sprinklers are used outside the dwelling unit, the number of design sprinklers in a corridor used to be five sprinklers in accordance with NFPA 13. However, this has been lowered to four sprinklers in this new section, which also can be applied to exterior breezeways when they are sprinklered.

Combustible Concealed Spaces (7.5) - The committee clarified that no increase is required to the design area based on the unsprinklered combustible concealed spaces in the building. This contrasts with NFPA 13, which requires an increase in the design area to 3,000 sq ft for density/area sprinklers and 8 sprinklers for residential sprinklers.

Water Tanks (9.5) - The committee clarified that water tanks need to be installed in accordance with NFPA 22.

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