

Changes in the 2016 Edition of NFPA 13 Discharge Criteria

The 2016 edition of NFPA 13 has just been published by the NFPA. This new edition of the standard contains a number of new requirements that are important to everyone in the fire sprinkler industry. The list is quite long, so it has been broken into a four-part series of special editions for TechNotes. These summaries 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 items with respect to installation, hanging and bracing, discharge, and residential.

This issue is Part 3. It will focus on the changes to the discharge criteria rules of NFPA 13. It has been prepared by Louis Guerrazzi, NFSA's Manager of Product Standards. The following items are highlighted from the revisions made in preparation of the 2016 edition:

Commodity Classification (5.6)

Two figures have been included (Figure 5.6.3.3.3.1 and Figure 5.6.3.3.3.2) to represent the allowable level of Group A plastics by volume and/or weight within Class III and Class IV Commodities. The first figure deals with Class III and Class IV Commodities cartoned or within wooden containers, while the second figure addresses exposed Class III and Class IV Commodities. These figures are intended to clarify the existing language.

Also, the list of Group A plastics found in section 5.6.4.1 has been updated to include Cellulosics, Nylon, and PVF (polyvinyl fluoride) which have been moved from Group B and Group C plastics.

Adjacent Hazards or Design Methods (11.1.2)

When dealing with two or more adjacent hazards, draft curtains have been specifically listed as an acceptable device in order to delay heat from a fire in one area from fusing sprinklers in an adjacent area. Also, a requirement for a 2-foot minimum distance from each hazard has been included when these partitions are installed over aisles, with the intent of maintaining minimum 4-foot aisles.

Hose Stream Allowance Combined Sprinkler/Standpipe (11.1.6.3.1)

A new section was added to clarify that for combined sprinkler/standpipe systems, no inside hose demand is required to be added to the sprinkler flow demand.

Quick Response Sprinkler Area Reduction (11.2.3.2.3.1)

As noted in part 1 of our NFPA 13-2016 Updates, the standard has included criteria for handling cloud ceilings. From this, there has been an exception which will allow the omission of sprinklers above cloud ceilings if certain conditions are met. This exception has been added as part of the criteria for using the quick response sprinkler area reduction, such that if sprinklers are omitted above cloud ceilings you would not be allowed to use QR area reduction.

Sprinkler Protected Glazing (11.3.5)

As noted in part 1 of these NFPA 13-2016 Updates, the standard now provides guidance on the combination of sprinklers and protective glazing as an alternative to required fire-rated wall or window assembly. This section in Chapter 11 requires that the water supply for design areas that include such a combination be required to have a duration matching the equivalent fire-rating.

Measurement methods for maximum roof height (12.1.3.1)

This section has included clarification for how to measure the maximum roof height for situations that include corrugated metal decks less than three inches deep, corrugated metal decks over three inches deep, when insulation is installed that is installed directly against the underside of the decking or when the insulation sags, and also for situations when the building height changes in steps.

Adjacent Hazard or Design Methods (12.3)

Similarly to the change to section 11.1.3 above, when dealing with two or more adjacent hazards, a requirement for a 2-foot minimum distance from each hazard has been included when these partitions are installed over aisles, with the intent of maintaining minimum 4-foot aisles. However, draft curtains were not added to this section and are not a permissible device to use a partition for storage applications when Chapter 12 is applied.

Control Mode Density/Area Sprinkler Protection for Indoor Storage of Idle Wood Pallets (Table 12.12.1.2(a))

The area of operation was standardized regardless of sprinkler temperature rating based on test data that was provided showing that larger design areas should not be required when ordinary temperature rated sprinklers with a k-factor 11.2 or larger are used. An exception was added for K-8.0 or larger with a maximum storage height of 6-feet to allow for a reduction of area of operation to 2000-square-feet when using either high temperature-rated sprinklers or when using K-factor of 11.2.

Solid Shelf Racks (New 13.1.3, Chapter 16 and Chapter 17, various)

A new section 13.1.3 was included during the second draft of the 2016 edition in order to duplicate the requirements of solid shelf racks from chapter 16 and chapter 17 into

miscellaneous storage chapter. The requirement is when solid shelves are used, in-rack sprinklers shall be installed in every level below the highest solid shelf under Chapter 16, Chapter 17, and Chapter 13 when not considered miscellaneous storage.

Group A plastic protection for Commodity Class I through IV (14.1.3)

A new section 14.1.3 has been included to clarify that protection criteria for Group A plastics shall be permitted to be used for Class I through Class IV commodities with same storage and height configuration.

Alternative Protection (16.1.2.4)

Alternative protection scheme and criteria for Class I through Class IV Commodities and Group A plastics when a greater level of protection than is available from the overhead sprinklers was added based on testing originally developed for protection of Class IIIB combustible liquids in plastic containers. Criteria is included for Single-Row racks, Double-Row racks and Multiple-Row Racks

Sprinklers in flue space (16.1.8.4)

Several sections were combined and moved to clarify where in-rack sprinklers should be located. In summary, in-rack sprinklers shall be installed in transverse flue spaces at the intersection of transverse and longitudinal flues while not exceeding the maximum spacing. There is also guidance on how to handle the situation where transverse flues exceed this spacing or if no transverse flues exist.

Fire Protection of Steel Columns within Storage Racks (16.1.4 and 17.1.4)

This section was added to clarify the intent of protection of steel columns within the rack structure. It was quantified that columns that are wholly or partially within the rack footprint inclusive of flue spaces or within 12-inches of the footprint, shall be protected. This both clarifies the old language “within the rack structure” and includes columns near the rack structure, within 12-inches, to be required to be protected.

Vertical Rack Members (16.1.4.2 and 17.4.2)

This section requires that for racks in excess of 15-feet high where vertical members support the building structure, that these vertical members shall be protected similarly to the protection of steel columns.

Protection of Group A exposed expanded plastics on racks (17.2.3.5 and 17.3.3.5)

Ceiling only protection criteria has been included for Group A exposed expanded plastics on racks based on full-scale fire testing provided by the Fire Protection Research Foundation. There are two design schemes which now allow for a maximum ceiling height of 40-feet with either a maximum storage height of 25-feet with a minimum operating pressure of 30 psi or a maximum storage height of 35-feet with an operating pressure of 60 psi. A TIA was submitted in order to achieve the lower pressure requirements for the lower storage height based on additional testing that was completed after the second draft of the 2016 edition of NFPA 13.

Some requirements are that intermediate temperature-rated ESFR pendent sprinklers with a nominal K-factor of K-25.2 be used at the ceiling, with a design area of the most demanding 15 sprinklers consisting of five sprinklers on three branch lines, along with solid vertical members and 8-foot aisles.

Summary Sheet (23.3.5.2)

The list of items to be included in the summary sheet has been expanded and revised to be consistent with industry practices and other information that many authority having jurisdiction require.

Velocity Limitation (23.4.1.4)

It has been explicitly stated that unless required by other NFPA standards, the velocity of water flow shall not be limited when performing hydraulic calculations.