



Tuesday e-Tech Alert
January 11, 2005

UL Tests Confirm Satisfactory Large Drop Sprinkler Performance

As reported in the December 28, 2004 NFSA eTechAlert, FM Global suspended the use of large drop sprinklers in new projects based on fire test results obtained during the calibration of its new fire test facility. While the action did not affect the FM approval of existing large drop sprinkler installations, the two manufacturers of large drop sprinklers (Tyco and Viking) were told to cease placing the FM approval stamp on new production.

In cooperation with the two sprinkler manufacturers, Underwriters Laboratories conducted their own full-scale testing during the first week of January, and found that both models of listed large drop sprinklers demonstrated performance equivalent to that determined in tests at the time of their initial listing. As such, the UL listings for these sprinklers will continue without interruption, and the large drop sprinklers can be used in conformance with their NFPA 13 design and installation criteria.

Recent NFSA Interpretations – Design Areas

Some recent informal interpretations by the NFSA Engineering staff on the subject of fire sprinkler design areas:

Q: When small areas of ordinary hazard are within a larger light hazard area, is it appropriate to calculate a single 1500 sq. ft. area, or do the ordinary hazard spaces require separate calculations?

A: There are three basic options available for calculations depending on the degree of separation between the areas of ordinary and light hazard. If there is no physical barrier, NFPA 13 (Section 11.1.2 in the 2002 edition) requires that the more demanding sprinkler protection capability be extended 15 ft into the lower hazard area along all boundaries, and the hydraulically most demanding area will usually encompass the higher hazard area plus as much of the lower hazard area as needed to satisfy the design area requirement. Where there is a physical separation between the hazard areas, the 15 ft extension of the higher hazard protection is not required, but the calculations will again include a combined area of both hazards. Where the compartment containing the higher hazard is sufficient to qualify for the room design method (fire resistive construction equivalent to the required water supply duration including automatic or self-closing doors), the demand of the smaller area of higher hazard can be calculated separately and compared to the demand of the larger area of lower hazard. As always, the hydraulically most demanding area must be satisfied.

Q: Are there situations in which it is advantageous to choose a point on a density/area curve other than the point at the base of the curve?

A: The use of the smallest design areas at the base of the curves generally produce the most economical designs because the product of density and area results in the smallest total water demands at those points. In some situations NFPA 13 or other standards require larger design areas based on concern for shielded or fast-spreading fires that can activate sprinklers over a larger area. Where not otherwise required, there are at least three situations in which the flexibility allowed by the curves can prove economical:

- 1) 1) The first is where the water supply is of strong flow but limited pressure. Use of lower densities makes use of available pressures and can avoid the need for a booster pump.
- 2) 2) The second is where staying at a density of 0.34 gpm/sq.ft. or less allows use of K-8.0 sprinklers, avoiding the NFPA 13 requirement (Section 12.1.13.3) for larger orifice sprinklers in storage applications with higher densities. Although NFPA clarifies the larger orifice requirement does not apply to existing storage application systems, the flexibility could be important where a building with existing K-8.0 sprinklers is subject to a change in occupancy or use.
- 3) 3) The third is where, for extra hazard and storage applications with densities below 0.25 gpm/sq. ft., it is economical to extend the maximum spacing between sprinklers from 12 ft to 15 ft, and the maximum coverage area from 100 sq. ft. to 130 sq. ft. (Tables 8.6.2.2.1(c) and (d) in the 2002 edition). Bays up to 30 ft in width could be protected with two branch lines instead of three.

In summary, the curves allow options that would not be available with only single-point density requirements.

Upcoming NFSA Technical Tuesday Online Seminar:

NFPA 13 Chapters 1-5 – Fundamentals and Hazard Classification

Instructor: Kenneth E. Isman, P.E.

Date: January 25, 2005

This seminar reviews the organization and content of the first five chapters of the sprinkler standard, beginning with the scope and purpose and including a discussion of how the standard can and can't be used. This is the first of a series of ten seminars dedicated to an in-depth review of the current (2002) edition of NFPA 13. This is your chance to learn from the experts who represent the fire sprinkler industry on the technical committees that write the sprinkler rules. Develop an appreciation for the way in which the material is organized in the 2002 edition while learning more about the background of the rules themselves.

The level of all seminar topics is considered intermediate. Because these seminars are being offered as a complete program on NFPA 13, a 30% discount is available when signing up for all ten seminars in the series.

Information and registration for this seminar is available at www.nfsa.org.

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In the promotion of the fire sprinkler concept, the National Fire Sprinkler Association represents all fire sprinkler industry interests including fire sprinkler contractors, manufacturers and suppliers of fire sprinklers and related equipment and fire protection professionals. Established in 1905, the National Fire Sprinkler Association provides publications, nationally accredited seminars, representation in codes and standards-making, market development, labor relations and other services to its membership. Headquartered in Patterson, New York, the National Fire Sprinkler Association has regional operations offices throughout the country.