NFPA has a host of standards and codes that are used to help us design, install, test, inspect and maintain fire and life-safety systems. When it comes to stairwell pressurization systems, the applicable standard is NFPA 92: Standard for Smoke Control Systems.

We have heard questions recently regarding smoke controls systems, and wanted to address the NFPA standard in this code update. NFPA 92, 2015 edition includes all the requirements previously found in two standards: NFPA 92A: Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences and NFPA 92B: Standard for Smoke Management Systems in Malls, Atria, and Large Spaces.

NFPA 92 covers all types of systems used to address the impact of smoke from fire, with mandatory provisions for the design, installation, and testing of both new and retrofitted smoke control systems in buildings – including openings and leakage through egress doors in stairways.

Stairwell pressurization systems come into play in the event of a fire emergency. When a building’s fire alarm system activates, it alerts occupants of a threat from fire and/or smoke. During a subsequent evacuation, people typically use stairwells as a path to relocate to a safe area or move outside the building.

The purpose of NFPA 92 is to establish requirements on how to best control the spread of smoke and allow building occupants to evacuate using stairwells.

When a fire alarm detects smoke, supply air fans are typically activated, in order to introduce a positive amount of air into the stairwells. In these circumstances, it’s critical that the proper amount of air be supplied to the stairwells. There’s a point at which too much air is a bad thing, as the pressure can make it difficult for building occupants to push open an egress door as they try to leave a floor. On the other hand, if too little air is supplied, the stairwell could become compromised and smoke may be able to penetrate the area.

NFPA 92 provides requirements on how to calculate the acceptable amount of air pressure that will allow proper functioning of doors during a pressurization event. It should be noted that Stairwell Pressurization Systems can be stand-alone, meaning no other smoke control systems are being applied in a building, or used in combination with other smoke control systems.

NFPA 92 makes reference to a Registered Design Professional (RDP) as a person qualified to design a smoke management system for a facility. Once that is complete, NFPA 92 is used by manufacturers, installers and maintainers as the standard for applying the design and guiding the installation and final checkout of a smoke management system, which often includes a stairwell pressurization system.

With regard to periodic testing and inspection, NFPA 92, 2015 edition houses all the requirements in Chapter 8, which is entitled simply as “Testing.” Section 8.1.2 states that “testing shall confirm that the design objectives described in Section 4.1 are achieved.” Section 4.1 describes the Design Objectives that need to be considered. These design objectives outline what the system is supposed to do, and they are required to understand how to properly design, install, maintain and test a system. Simply installing supply and exhaust fans in a building is not considered a plan with appropriate design objectives. If there is no planning on how a system is supposed to function, then it’s meaningless to just test whether fans turned on or off.

Section 8.4.6.3 in NFPA 92, 2015 applies to Stairwell Pressurization Systems. It provides requirements for stand-alone Stairwell Pressurization Systems and systems incorporated into a combination smoke control system.

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