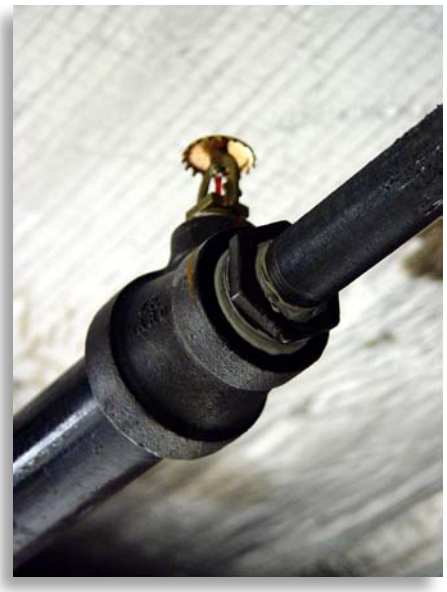
Coffee Break Training - Fire Protection Series

Automatic Sprinklers: Reducers and Bushings

No. FP-2012-26 June 26, 2012

Learning Objective: *The student shall be able to describe conditions where reducing bushings are permitted in automatic sprinkler system pipes.*

The hexagonal pipe element in today's illustration is a threaded reducer bushing. It is inserted in the end of the branch line to reduce the pipe size from the larger tapered fitting to the smaller diameter pipe at the right hand side of the picture.



This reducing bushing may not be used as part of a permanent sprinkler pipe installation. *Photo courtesy of Keith Heckler, Rockville Fire Department, Maryland.*

Generally, National Fire Protection Association (NFPA) 13, *Standard for the Installation of Sprinkler Systems*, prohibits the use of these bushings and allows only one-piece tapered reducers where pipe size transitions occur. The threaded bushing increases the friction loss and turbulence in the pipe which affects water distribution onto a fire.

One-piece tapered reducers for branch lines typically range from 3/4- to 6-inch (20 to 150 mm Diameter Nominal (DN)) in diameter at the large end to 1/2- to 4-inch (15 to 100 mm DN) at the smaller end. They are preferred over bushings because of their flow characteristics.

There are, however, several conditions where hexagonal or face bushings (face bushings have no outside edge to which a wrench can be attached) are permitted.

- Hexagonal and face reducer bushings may be used to reduce the size of pipe openings when standard fittings of the required size are not available.
- The prohibition against hexagonal and face reducer bushings does not apply when sprinkler fittings are made of post-chlorinated polyvinyl chloride (CPVC).
- In new installations, where sprinklers are expected to be installed below a ceiling, minimum 1-inch (25 mm) outlets with hexagonal bushings are permitted to accommodate sprinklers attached directly to the branch line fittings for future system modifications. The hexagonal bushings should be removed when the ceiling is installed and the final locations for armovers or drops have been established.

For additional information, refer to NFPA 13, Chapters 6 and 8.