



Automatic Sprinklers: Antifreeze System Expansion Chambers

No. FP-2011-15 April 12, 2011

Learning Objective: The student shall be able to identify the installation requirements for expansion chambers on automatic sprinkler systems.

This past winter's frigid and snowy weather served as a reminder that some sprinkler systems may be installed with antifreeze solutions to protect the pipe from cold temperatures. Antifreeze systems often are used for isolated portions of sprinkler systems where the expense and maintenance of a dry-pipe valve is undesirable.

Antifreeze systems, though, have their own special set of conditions that must be in accordance with National Fire Protection Association (NFPA) 13, *Standard for the Installation of Sprinkler Systems*. Perhaps most importantly, a temporary interim amendment to NFPA 13 prohibits the use of antifreeze within the dwelling unit portions of a sprinkler system.

Today's illustration provides an example of an unauthorized component on a sprinkler system. Some antifreeze systems are equipped with expansion chambers that allow the water:antifreeze solution to expand without rupturing the sprinkler pipe. (A listed 1/2-in. (12.7 mm) relief valve may be allowed in lieu of the expansion chamber if the antifreeze system volume does not exceed 40 gal (151 L).)

The expansion chamber is installed in a heated space between a backflow prevention device and the unheated space. The backflow prevention device prevents the water:antifreeze solution from back-siphoning into the sprinkler system, and helps maintain the proper water:antifreeze ratio in the unheated area.

Expansion chambers must be listed for fire protection service. According to the manufacturer of the product in today's illustration, it is "designed for installation on potable water lines between the backflow preventer or pressure reducing valve and the water heater to protect against water thermal expansion [italics added]." It is not listed for fire protection service. The inspector should note this deficiency and make arrangements to have it corrected.

For additional information, including illustrations for compliant installations and water:antifreeze solutions, refer to NFPA 13, Chapter 7.



This expansion chamber is not listed for fire protection service. Photo courtesy of Byron Blake.

