



Coffee Break Training - Fire Protection Series

Automatic Sprinklers: Aboveground Sprinkler Pipe Pneumatic Testing

No. FP-2013-16 April 16, 2013

Learning Objective: Given a copy of National Fire Protection Association 13, the student shall be able to identify the requirements for pneumatic testing of an aboveground sprinkler pipe.

The importance of hydrostatic testing newly installed or renovated sprinkler systems was discussed in Coffee Break Training 2009-15. These tests are conducted to assure the sprinkler fitters' work will not result in any leaks, or if leaks are detected, they are repaired promptly.

Normally, wet pipe sprinkler systems are installed in environments where the ambient temperature will not dip below 40 F (4.4 C). This threshold is intended to protect the wet pipe sprinkler system from low temperatures that will result in freezing. As water freezes, it expands inside the sprinkler pipe and may result in small leaks or even catastrophic failure.

In those areas where lower temperatures can be expected, dry pipe and preaction systems may be employed. Rather than water-filled overhead pipes, these have pressured air or nitrogen inside the pipe to hold back water pressure or monitor the conditions within the system.

Dry pipe and double interlock preaction sprinkler systems require another pressure test before they can be put into service: an air pressure test.

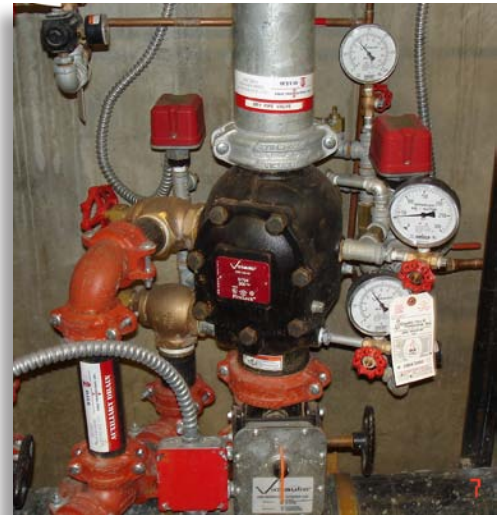
In addition to the standard hydrostatic test, an air pressure leakage test at 40 pounds per square inch (2.8 bar) should be conducted for 24 hours. This testing also is known as "pneumatic" testing because the pipe is filled with air and then pressurized. Any leakage that results in a loss of pressure in excess of 1 1/2 psi (0.1 bar) for the 24 hours should be corrected.

Where systems are installed in spaces that are capable of being operated at temperatures below 32 F (0 C), air or nitrogen gas pressure leakage tests should be conducted at the lowest nominal temperature of the space. This may include spaces such as cold storage warehouses, freezers or outdoor locations that are routinely exposed to frigid temperatures.

After the dry pipe or double interlock preaction sprinkler system has been filled with air to begin the test, the starting air gauge pressure above the riser should be recorded to document any changes over the next 24 hours. Any leaks or pressure loss must be identified and fixed before the system can be approved for service.

Inspectors may notice pressure changes over time; this may be the result of a leak or simple changes that have occurred in the ambient temperature. Next week's Coffee Break Training will explain how to calculate the pressure changes that result from temperature fluctuations.

For additional information, refer to NFPA 13, *Standard for the Installation of Sprinkler Systems*.



The aboveground pipe that this dry pipe sprinkler valve supplies should be subjected to both a hydrostatic and pneumatic pressure test.



Eligible for Continuing Education Units (CEUs)
at www.usfa.fema.gov/nfaonline

For archived downloads, go to:
www.usfa.fema.gov/nfa/coffee-break/