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## CODE COMPLIANCE GUIDELINE **ANTIFREEZE SOLUTIONS IN SPRINKLER SYSTEMS**

FOR BUILDINGS WITH ANTIFREEZE FIRE SPRINKLER SYSTEMS

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This publication outlines the *Virginia Statewide Fire Prevention Code* (i.e., Fire Prevention Code or SFPC) requirements related to the maintenance of automatic fire sprinkler systems located in Fairfax County and the towns of Clifton, Herndon, and Vienna prior to and during the onset of freezing weather.

Questions regarding this publication should be directed to the Fire Protection Systems Branch at 703-246-4821 during regular office hours, Monday thru Friday, 5:00 a.m. to 3:00 p.m.

## OVERVIEW

**Owner Responsibility.** In accordance with Section 110.2 of the Fire Prevention Code, the owner is responsible for the safe and proper maintenance of any structure or premises. In all structures the fire protection equipment, means of egress, alarms, devices and safeguards shall be maintained in a safe and proper operating condition.

**Code Requirements.** Sections 901.4 and 901.6 of the Fire Prevention Code require fire protection systems to be maintained in an operative condition at all times in accordance with the original installation standards for that system. Additionally, Section 901.6.1 of the Fire Prevention Code requires that automatic fire sprinkler systems be inspected, tested, and maintained in accordance with NFPA-25 (*Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2011 Edition). This publication cites specific procedures from NFPA-25 related to the maintenance of automatic fire sprinkler systems prior to and during freezing weather, which can be effective in the prevention of frozen systems.

## PROCEDURES

**Antifreeze System Solution Testing.** For wet pipe sprinkler systems designed for and protected with an antifreeze solution, the freezing point of the solution must be tested annually as described below and measuring the specific gravity with a hydrometer or refractometer and adjusting the solution as needed. It is important that the use of antifreeze solutions be in accordance with state or local health codes.

1. Antifreeze solutions in sprinkler systems are required to be tested annually prior to the onset of freezing weather.
2. Existing sprinkler systems utilizing antifreeze solutions shall be tested to determine that it contains a permitted type of antifreeze in compliance with the requirements of NFPA-25. If the test confirms the presence of approved antifreeze, further tests in accordance with NFPA-25 shall be conducted to confirm proper antifreeze concentrations.

3. If the antifreeze solution is found to be one that is no longer permitted, cannot be reliably determined, or contains an incorrect concentration, the sprinkler service company shall submit forthwith a “notice of deficiency”.
4. All antifreeze solutions newly placed into existing fire sprinkler systems must be factory premixed by the antifreeze manufacturer at the proper concentration.
5. The freeze point information from the antifreeze manufacturer or the generic information found in the Annex material of NFPA-25 (March, 2011 Edition) are to be followed to determine concentration.
6. All records regarding sprinkler system inspection, testing, and maintenance shall be maintained by the owner in accordance with the requirements of NFPA-25.
7. If it is determined that the solution found in the system is no longer permitted or if the type of antifreeze cannot be reliably determined, the system must be drained and replaced with an acceptable factory premixed solution.
8. If all the initial tests indicate that the solution type is acceptable, test samples must be taken at the top and bottom of each system (in some cases, an additional sample must be taken).
9. If all the test samples indicate a concentration of **glycerin** not greater than 50% by volume or **propylene glycol** not greater than 40% by volume, then the solution is permitted and may remain in the system.
10. If any of the samples indicate a concentration in excess of the permissible maximum concentrations (*i.e.*, **50% glycerin / 40% propylene glycol**), the system must be emptied and refilled with a factory premix solution.
11. For newly introduced **glycerin** solutions (the only type permitted with listed CPVC pipe), the solution is to be a factory premixed solution with a concentration not exceeding 48% by volume.
12. For newly introduced **propylene glycol** solutions, the solutions must be factory premixed solutions with a concentration not exceeding 38% by volume.

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