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Antifreeze Solutions in Residential Fire Sprinkler Systems

The 2013 edition of NFPA 130, as amended by TIA 13-1, discourages the use of antifreeze solutions within residential fire sprinkler systems unless no other practical freeze protection options are available. It is now necessary to research and eliminate other freeze protection options prior to choosing antifreeze. This determination must be submitted to the fire and/or building departments with every submittal utilizing antifreeze solutions.

Construction considerations utilizing freeze protection options other than antifreeze should be started early in the home design process. The owner, architect, and contractor should be made aware that options are available for avoiding or minimizing the use of non-listed antifreeze solutions. These options may include, but are not limited to the following:

1. Maintaining the temperature in the areas where the fire sprinkler pipe is Installed above 40F and utilizing a wet pipe system.
2. Installing a dry pipe or preaction fire sprinkler system.
3. Utilizing dry pendent or dry sidewall sprinklers extending from heated areas of the house into unheated areas.
4. Heat tracing (heat tape) systems on the pipe in the freezing areas of the house. Heat tracing system is required to be specifically *listed* for this application.
5. Utilizing a listed antifreeze solution although none are available as of January 2014.

These options must be considered In each residence prior to selecting antifreeze as the only practical freeze protection solution.

When all other freeze protection options have been explored and eliminated, antifreeze solutions may be used In accordance with NFPA 13D Section 9.22.2 (TIA 13-1) and the State Fire Marshal Informational Bulletin 1813-009. Both of these documents require documentation be presented to the enforcing agency to substantiate the use of the antifreeze solution.

This documentation must indicate that other freeze protection options were explored and eliminated as not practical. The documentation must also consider factors such as maximum concentration of antifreeze, minimum anticipated temperature, system pressure, maximum ceiling height, arid sprinkler orifice size. Assistance with this determination may be found in the reports prepared by the NFPA Fire Protection Research Foundation (FPRF) at the following link http://www.nfpa.org/antifreeze.

The documentation should address the concerns listed on the following page and provide a basis for the proposed antifreeze system.

1. What were the alternatives considered prior to selecting antifreeze to protect the residence? Why were these options not selected?

2. What is the minimum anticipated temperature at this site? This Information can be obtained from websites such as http://www.wunderground.com/history/ and should be included with the submitted documentation.

3. What is the minimum concentration of antifreeze required to protect the system at this temperature? Reference NFPA 13D 2013 Table A.12.3.5 or manufacturer specific data.

4. What is the water pressure at this site? Some FPRF research suggests that optimum pressures In antifreeze systems are 50 psi or less.

5. What are the K factors of the sprinklers being utilized In the system design? Some FPRF research suggests that sprinklers with K factors of 4.20, or greater, are optimum for antifreeze systems.

6. What Is the maximum ceiling height? Some FPRF research suggests that the optimum ceiling height for antifreeze systems Is 20 feet, or less.

Proposed Antifreeze System

A premixed antifreeze system of (circle one) glycerine or propylene glycol at a concentration of_____ is proposed.

2. The minimum anticipated temperature at this site is _____.

3. The antifreeze manufacturer is _____.

4. The maximum system pressure is_____ psi.

5. The maximum ceiling height in feet.

6 The proposed sprinkler is _____ with a K factor of _____ .