Department of Community Affairs

Division of Fire Safety Fire Code Enforcement

BULLETIN: 2010-5

SUBJECT:	**Antifreeze in existing NFPA 13, 13D and 13R fire sprinkler systems**
REFERENCE:	N.J.A.C. 5:70-3, 906.1
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Recently, the National Fire Protection Association (NFPA) released a safety alert recommending the following for all existing antifreeze systems:

"*NFPA sprinkler standards are installation standards and do not currently address the problem of antifreeze in existing systems. NFPA, in its role as a safety advocate, believes that owners and contractors should take immediate steps to review the status of their existing residential sprinkler systems and take appropriate action. A complete ban on antifreeze is appropriate for new systems during the period that the NFPA standards committees review the Fire Protection Research Foundation reports and determine whether limited use of antifreeze in these systems is appropriate. A more difficult problem presents itself, however, with existing systems, some of which cannot be easily retrofitted or redesigned so as to avoid the need for antifreeze. Because of the lifesaving benefit of these systems, simply shutting down these systems should not be an option. For owners and contractors who now must determine how to handle these systems, NFPA is offering the following guidance regarding existing systems: Residential fire sprinklers are extremely effective fire protection devices, significantly reducing deaths, injuries, and property loss from fire. These systems should not be disconnected.*

Existing residential fire sprinkler systems, whenever possible, should not contain an antifreeze solution.

If you have, or are responsible for, an existing residential occupancy with a fire sprinkler system, contact a sprinkler contractor to check and see if there is antifreeze solution in the system.

If there is antifreeze solution in the system, determine if other means, such as insulation, can be used to provide adequate freeze protection.

If there is no viable alternative to antifreeze solutions, NFPA recommends the following:
o Use only propylene glycol or glycerin antifreeze solution.
o The antifreeze solution should be the lowest possible concentration required for the needed freeze potential, but under no circumstance should the antifreeze solution exceed a maximum concentration of 40% of propylene glycol or a maximum concentration of 50% of glycerin. Consideration should be given to reducing these concentrations by an additional safety factor.
o The antifreeze solution should only be a factory pre-mixed solution; use of factory pre-mixed solutions is essential to ensure the proper concentration level and solution integrity.
*o Antifreeze solutions should only be used with the approval of the local authority having jurisdiction.***"**

The Fire Protection Research Foundation had burn tests conducted at Underwriters Laboratories to collect data on the reaction of different antifreeze solutions when exposed to fire. Tests were conducted with many different levels of antifreeze solutions in the sprinkler systems. Some tests confirmed that there is a risk of ignition when higher levels of antifreeze are installed in the systems. The tests revealed that mixtures of 70% glycerin and 30% water caused a flash fire when the sprinkler head operated. The test also showed that 60% propylene glycol and 40% water also caused a flash fire when the head operated. Further testing revealed that no ignition of the antifreeze spray was observed with propylene glycol not exceeding 40% or glycerin not exceeding 50%.

After reviewing the final report from NFPA issued August 11, 2010 and the Underwriters Laboratories Inc. Fire Test Data Summary issued May 26, 2010, the Division of Fire Safety is reminding Fire Officials that *all* antifreeze systems are required to be tested annually in accordance with NFPA 25. When levels of propylene glycol exceed 40% or levels of glycerin exceed 50%, the systems should be drained into containers and properly disposed of per the manufacturer's instructions. The replacement antifreeze must be new factory premixed solutions at 40% or 50% respectively. NFPA tables show that a 40% mixture of propylene glycol to 60% water will maintain the freeze level at -6℉ and a 50/50 mixture of glycerin and water at -20℉.

Note: <u>All</u> fire sprinkler systems containing antifreeze must be tested annually, not just residential systems.

This bulletin will remain in effect until withdrawn or replaced. Questions regarding this bulletin are to be directed to the Bureau of Fire Code Enforcement at 609-633-6132 or through our website – www.nj.gov/dca/dfs .