



California State Fire Marshal Information Bulletin – IB13-009

Issued: December 30, 2013

ANTIFREEZE USE IN NFPA 13D (2013 EDITION) RESIDENTIAL FIRE SPRINKLER SYSTEMS AS REFERENCED IN THE 2013 CALIFORNIA BUILDING STANDARDS CODE

At the National Fire Protection Association (NFPA) Standards Council meeting August 2013, a final decision was made to issue the tentative interim agreement (TIA) 13-1, TIA Log #1067, on NFPA 13D 2013 edition, respectively to address to the use of antifreeze solutions within all NFPA 13D applications (One- and Two-Family Dwellings). This information is available for review on the NFPA website at <http://www.nfpa.org/antifreeze>.

The CAL FIRE – Office of the State Fire Marshal's (OSFM) adoption of the 2013 edition of NFPA 13D standard maintains the intent of the original of the OSFM emergency regulations adopted for the 2010 California Residential Code and NFPA 13D. The OSFM's emergency regulation limited the use of antifreeze solutions to only premixed solutions and placed limitations on the maximum concentrations. This most recent TIA issued by NFPA has led to some confusion regarding the use of non-listed antifreeze in new construction.

The following is provided to clarify the OSFM's adoption and intent:

1. NFPA 13D Section 9.2.2.1 does require the use of listed antifreeze.
2. NFPA 13D Section 9.2.2.1.1 allows non-listed antifreeze solutions in premix only with limitations on the concentration for existing systems.
3. NFPA 13D Section 9.2.2.2 provides an exemption for the enforcing agency to approve a non-listed solution in the case of antifreeze concentrations for premixed Glycerine at or below 48% or premixed Propylene Glycol at or below 38% where documentation justifies the use of those concentrations for specific portions of the home (See reports listed below issued by the Fire Protection Research Foundation).
4. NFPA 13D Section 9.2.2.2.1 requires documentation be presented to the enforcing agency to substantiate the use of the antifreeze solution.

The OSFM's adoption of NFPA 13D specifically Section 9.2.2.1 and 9.2.2.2 does not prohibit non-listed antifreeze, but rather affords the use of premixed solutions that maintain limited concentration levels.



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The OSFM strongly recommends reviewing the testing report for detailed information on the results and findings issued by the Fire Protection Research Foundation noted below. This research testing appears to indicate that alternatives to antifreeze should be used for newly installed residential fire sprinkler systems. Alternatives to antifreeze additives include dry pipe systems, additional insulation, and design considerations that do not expose pipes to freezing conditions. Should these or any other alternatives not be available for new construction, the OSFM suggests the provisions as indicated in NFPA 13D Section 9.2.2.2 may be used until such time a listed antifreeze solution is available. Again the solution should only be factory premixed and used with the approval of the local authority having jurisdiction.

If these solutions are used, all relevant data and information should be carefully reviewed and considered in the sprinkler system. The following is a list of research reports that have been issued by the Fire Protection Research Foundation related to the use of antifreeze in sprinkler systems:

1. *Antifreeze Systems in Home Fire Sprinkler Systems – Literature Review and Research Plan*, Fire Protection Research Foundation, June 2010.
2. *Antifreeze Systems in Home Fire Sprinkler Systems – Phase II Final Report*, Fire Protection Research Foundation, December 2010.
3. *Antifreeze Solutions Supplied through Spray Sprinklers – Interim Report*, Fire Protection Research Foundation, February 2012.

The above reports may be downloaded from the NFPA Fire Protection Research Foundation:
<http://www.nfpa.org/research/fire-protection-research-foundation/reports-and-proceedings/suppression/other-sprinkler-protection/antifreeze-solutions-supplied-through-spray-sprinklers>

The above research demonstrated that large scale ignition of the sprinkler spray did not occur in tests with sprinkler discharge onto a fire having a nominal Heat Release Rate (HRR) of 1.4 MW with 50% Glycerine and 40% Propylene Glycol Antifreeze Solutions.

As more information is released by NFPA, the Standards Council and/or the Technical Committee, the OSFM will notify all interested parties. The sustained efforts of all stakeholders must focus on sharing information; working together; and continue to support the message that fire sprinklers are one of the most effective ways to save lives and property from fire; and to that end, assure the successful implementation of the 2013 California Residential Code and the residential fire sprinkler provisions.

For more information please visit our website <http://osfm.fire.ca.gov>