



California State Fire Marshal Information Bulletin – IB0910

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ANTIFREEZE USED IN RESIDENTIAL FIRE SPRINKLER SYSTEMS

At the August meeting of the National Fire Protection Association (NFPA) Standards Council meeting held in Boston, Massachusetts a final decision was made to issue the tentative interim agreements (TIA) 1000, 995, and 994 on NFPA 13, NFPA 13R and NFPA 13D, respectively to prohibit the use of antifreeze solutions within all NFPA 13D applications and within the dwelling unit portions of NFPA13 and NFPA 13R sprinkler systems. This information is available for review on the NFPA website at <http://www.nfpa.org/antifreeze>.

The nexus for the research by NFPA is based on two incidents involving antifreeze protected residential fire sprinkler systems under pressure in excess of 100 psi. The second phase report included two separate scope tests. The results of Scope A testing indicated that certain concentrations of propylene glycol- or glycerin-water solution have the potential to ignite when discharged through residential fire sprinkler systems. The potential for ignition depends on several factors including the propylene glycol- or glycerin-water solution, ignition source, sprinkler model, sprinkler elevation, and discharge pressure. The NFPA Standards Council believes the research and testimony at the recent council meeting suggests that antifreeze solutions of propylene glycol **exceeding** 40% and glycerin **exceeding** 50% by volume are not appropriate for use in home residential fire sprinkler systems until research and testing are completed and vetted through the appropriate technical committees. The Standards Council also recognizes the need to limit the use of on-site mixing; when antifreeze is used, whereas the product should be a factory pre-mix to obtain the correct concentration.

For existing residential fire sprinkler systems where there is no viable alternative to antifreeze solution use, the Office of the State Fire Marshal (OSFM) concurs with the latest NFPA directive of draining the system and replacing with a solution **not to exceed** a maximum concentration of 40% of propylene glycol or a maximum concentration of 50% glycerin. Additionally, the solution should only be factory pre-mixed and used with the approval of the local authority having jurisdiction. The OSFM strongly recommends reviewing the testing report for detailed information on the results and findings. An alternative to increased antifreeze concentrations may include protecting pipes with additional insulation.



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For new residential fire sprinkler systems, the OSFM recognizes the information provided in the testing report involves many factors that impact the systems' performance during the research testing conducted by the Underwriting Laboratory. 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 the above paragraph for existing systems may be used until such time a code modification is promulgated by the OSFM through the California Building Standards Commission rulemaking process. Again the solution should only be factory pre-mixed and used with the approval of the local authority having jurisdiction.

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 2010 California Residential Code and the residential fire sprinkler provisions.

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