



**State of Wisconsin**  
**DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES**

**DATE:** January 05, 2023

**SUBJECT:** Important information regarding the use of antifreeze in automatic fire sprinkler systems

According to the National Fire Protection Association, fire sprinklers are effective in 96% of the fires in which they operate. This saves lives, prevents injury, and minimizes property damage. Additionally, the rate of firefighter injury is 60% lower when fire sprinklers operate.

While effective in mitigating the impact of fires, some fire sprinkler systems could be compromised if interior temperatures dip below 40 degrees Fahrenheit. For that reason, many automatic fire sprinkler systems use antifreeze to prevent system piping from freezing, related system disruption, and property damage. However, the National Fire Protection Association (NFPA) determined that some existing antifreeze solutions can, in certain circumstances, fuel fires rather than control them. As a result, the NFPA updated its rules about the allowable use of antifreeze in 2013.

The State of Wisconsin currently adopts NFPA 13 – 2013: Standard for the Installation of Sprinkler Systems. Alterations to existing automatic fire sprinkler systems and newly installed automatic fire sprinkler system installations are required to use a listed antifreeze solution to comply with the 2013 edition of NFPA 13.

The State of Wisconsin currently adopts NFPA 25 – 2011 edition standards for the inspection, testing, and maintenance of automatic fire sprinkler systems. The new requirements from the NFPA in 2013 are not enforceable by the State of Wisconsin DSPS for existing unaltered automatic fire sprinkler systems until newer codes are adopted. Please note that while not a requirement of current code, many building owners and fire sprinkler firms have chosen to be proactive and switch over to the newer listed antifreezes to ensure the public safety of building occupants.

A simple exchange of the older antifreeze solutions with the newer listed solutions is not that simple. Due to the criteria to which the listed antifreeze solutions must conform, additional changes to the existing automatic fire sprinkler system design may be necessary to ensure proper protection. The current listed solutions require an alternative means of hydraulic calculation and present a higher level of toxicity. The higher level of toxicity requires a more stringent means of

back-flow prevention than what was previously installed in most existing systems. Per current State of Wisconsin Plumbing Code, the means of back-flow prevention is required to be upgraded in this case to prevent contamination of water supplies.

Alterations to existing automatic fire sprinkler systems to utilize a listed antifreeze solution may require plan review to ensure the proper functioning of the systems and the adequacy of water supply protections.

**All new installations and alterations utilizing listed antifreeze must comply with State of Wisconsin Plumbing Code SPS 382.41(3)(a).**

The State of Wisconsin DSPS is aware that some UL 2901 listed antifreeze solutions contain chemical additives (e.g., corrosion inhibitors), in addition to aqueous solutions of glycerin or propylene glycol, and may not meet the definition of ‘Non-Toxic’ as defined in Wis. Admin. Code s. SPS 381.01(163):

*SPS 381.01(163) “Nontoxic” means a substance in the diluted form that meets one of the following requirements:*

*(a) Is listed by the National Sanitation Foundation (NSF) as meeting the NSF evaluation criteria for nonfood compounds. <https://info.nsf.org/usda/Listings.asp>*

*(b) Is acceptable to the United States Food and Drug Administration (FDA) Title 21 section 175.300 of the Federal Regulation on Food Additives.*

*(c) Is acceptable for contact with potable water or is deemed non-toxic by a third-party certification that is acceptable to the department. <https://info.nsf.org/Certified/PwsChemicals/>*

*(d) Is deemed non-toxic by the department.*

These chemical additives in a fire suppression system would not be considered a ‘water-based fire suppression system’ as listed in Wisconsin Administrative Code Table 382.41–2 due to the failure to meet the above-referenced requirements. The use of low hazard cross connection control devices (e.g., ASSE 1015, ASSE 1048 compliant devices) are allowed only for fire suppression systems using listed “non-toxic” antifreeze solutions.

Per Wisconsin Administrative Code s. SPS 382.41(3)(a) systems that contain toxic additives require a cross connection control device conforming to one of the following standards:

- Reduced Pressure Principal Backflow Preventers and Reduced Pressure Fire Protection Principal Backflow Preventers ASSE 1013-2011;
- Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies ASSE 1047-2011; or
- An alternative high-hazard cross-connection control device acceptable to the Department.

Please note that NFPA 13 – 2013 edition section A.24.1.8(3) also recommends the use of a reduced pressure zone-type backflow preventer for fire suppression systems using antifreeze solutions.

For more information about the code changes and for approved antifreeze solutions, please visit the National Fire Protection Association website [HERE](#).

Questions regarding this subject are to be submitted to [DSPSSBFireprotech@Wisconsin.Gov](mailto:DSPSSBFireprotech@Wisconsin.Gov)

**Summary of Antifreeze requirements in Fire Suppression Systems in the State of Wisconsin**

	Applicable antifreeze solution required	Maintenance Requirement*	System alterations after May 1, 2018
New or altered system where code applies date is on or after May 1, 2018	Listed antifreeze per 2013 NFPA 13	System must be maintained in original condition (listed antifreeze per 2013 NFPA 13)	Listed antifreeze per 2013 NFPA 13
Installed or altered system where code applies date is prior to May 1, 2018	Antifreeze solution per 2011 NFPA 25	May use original solutions. If upgraded to a listed antifreeze solution, this alteration must meet 2013 NFPA 13 and current backflow protection requirements	Listed antifreeze per 2013 NFPA 13 and must meet current backflow protection requirements

\*Local fire code ordinances regarding inspection, testing, and maintenance of all fire safety features in public buildings and places of employment may be more restrictive than the minimum state fire code Chapter SPS 314, Wis. Adm. Code which at the time of this document adopts 2011 NFPA 25.