

**FM Global Property Loss Prevention Data Sheet 2-1 *Corrosion in Automatic Sprinkler Systems*** - <http://www.fmglobal.com/research-and-resources/fm-global-data-sheets>

- **2<sup>nd</sup> Interim Revision Updated April 2018**
- **2.2.1.10.1 Dry-Pipe and Preaction Systems Using Nitrogen**
  - A. Pressurize the system using an FM Approved nitrogen generator. Alternatively, nitrogen cylinders may be used, or another suitable supply if compressed air is provided as backup.
  - B. Black steel pipe is acceptable in dry-pipe and preaction sprinkler systems if nitrogen will be used throughout the life of the system. If it will not, use galvanized steel pipe.
- **3.9 Chemical Cleaners and Corrosion Inhibitors** - Piping cleaning treatments and corrosion inhibitors for the purpose of halting identified corrosion activity have proven to be troublesome when used in fire protection systems. The introduction of a treatment solution into a sprinkler piping network with dead-end pipe runs and pendent drops can result in a large variation of solution concentrations and exposure time throughout the system. Consistent concentration levels and full removal of the treatment solution and any dislodged pipe scale are necessary to ensure a successful system treatment. This has proven to be very difficult in practice for sprinkler systems. Most vulnerable to these treatments are pendent sprinklers, which can serve as low points for the collection of stratified treatment chemicals, pipe scale, or both. This can result in accelerated sprinkler corrosion (leaks) or restricted sprinkler orifices.
- **Department of Defense (DoD) Unified Facilities Criteria (UFC 3-600-01) April 2018 (pgs. 94-95)** - <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-600-01>
  - This is the Code that is used for ALL Department of Defense facilities worldwide.
  - **Section 9-6.3.6** When nitrogen is utilized in dry or preaction sprinkler systems, a C-factor of 120 is permitted to be used in hydraulic calculations.
  - **Section 9-7.6 Piping**
    - 9-7.6.1.1 Galvanized piping is ONLY permitted for deluge sprinkler systems, valve trim piping and drain piping exposed to the Facility exterior.
    - 9-7.6.1.2 Black steel pipe must be used for the addition, repair or relocation of existing galvanized pipe in wet pipe, dry pipe or preaction systems.
  - **Section 9-7.7 Nitrogen Generation Systems.**
    - 9-7.7.1 Design the nitrogen generation system so **all equipment** is installed within the confines of the riser room with the exception of a connection for a manual gas analyzer.
    - 9-7.7.2 Provide a nitrogen generation system that is capable of delivering a minimum of 98 percent nitrogen composition throughout all of the system piping within 14 days from the commencement of the inerting process.
    - 9-7.7.3 The nitrogen generation system must be self-contained with "drop-in" operability with a simple one step direct connection of the nitrogen gas supply line to each zone.

- 9-7.7.4 The use of stand-alone compressed nitrogen bottle system is not permitted.
- 9-7.7.5 A process that involves continuous venting of the piping network is not permitted.
- 9-7.7.6 Any air maintenance device used in conjunction with the nitrogen generation system must be listed or approved for use on sprinkler systems.
- **Section 9-7.8** Preaction Systems.
  - 9-7.8.1 Preaction systems must utilize nitrogen complying with the "Nitrogen Generation Systems" section of this UFC, in lieu of air.
- **Section 9-7.9** Dry Pipe Systems.
  - 9-7.9.1 Dry pipe systems must utilize  $\frac{1}{2}$  nitrogen complying with the "Nitrogen Generation Systems" section of this UFC.  $\frac{1}{2}$
- **General Services Administration (GSA) PBS-P100 Facilities Standards for the Public Buildings Service April 2017 (pgs. 230-232) -**  
[https://www.gsa.gov/cdnstatic/2017\\_Facilities\\_Standards\\_P100%29C2%A0.pdf](https://www.gsa.gov/cdnstatic/2017_Facilities_Standards_P100%29C2%A0.pdf)
  - This is the Fire Code that is used for all General Services Administration facilities worldwide.
  - **Section 7.8** Automatic Sprinkler and Standpipe Systems
    - Dry-pipe sprinkler systems must incorporate a nitrogen inerting process that replaces air with nitrogen gas when used to charge, maintain, or supervise a dry-pipe sprinkler system.
    - Antifreeze sprinkler systems are not permitted to be installed.
    - Pre-action-type sprinkler systems are not permitted to be installed.
  - **Section 7.8.2** Sprinkler Piping
    - Galvanized (internal and external) sprinkler piping is not permitted to be used for dry-pipe sprinkler systems.

This code language has been sourced from publicly available documents that are available on the internet as referenced in the citing.