AFSA45
SELLING THE VALUE OF CORROSION PROTECTION
Presenters
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SAN ANTONIO, TX
AFSA
American Fire Sprinkler Association

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Tate Hitzeman
Potter Electric Signal Company, LLC
Jeff Merwin
POTTER
The Symbol of Protection
Tate Hitzeman is a Sales Manager with Potter Electric Signal. With over 13 years of experience in the fire sprinkler industry, Tate brings a wealth of knowledge, expertise, and leadership to the industry. Tate's career began with Globe Fire Sprinkler Corporation, where he spent six years honing his skills and gaining invaluable experience.
Following this, Tate joined Potter, where he has continued to use his talents for over six years, consistently demonstrating excellence and a commitment to safety and innovation. Tate has also been actively involved with the American Fire Sprinkler Association (AFSA) for a decade. His dedication to the industry is evident through his participation and leadership in various capacities within AFSA.
Jeff Merwin is the Director of Business Development for Potter Electric Signal Company. Over 40 years of developing and applying products in fire protection, security, HVAC, and industrial control applications have provided a wealth of product and application knowledge. He has been responsible for ensuring that the products meet end users' needs as well as meeting all technical requirements for listings and approvals domestically and globally.
Jeff has served as an instructor for SFPE chapters around North America, Sprinkler Fitters Locals, fire protection associations and chapters, and facility / building management associations. He is an active member in the NFPA, SFPE, and sits on safety standards committees for ASME. He holds a Bachelor of Science in electrical engineering from Washington University in Saint Louis and is a named inventor on seven US patents.
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The authority on fire, electrical, and building safety
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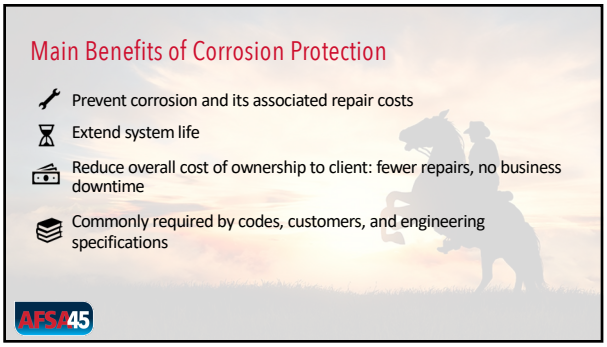
Main Benefits of Corrosion Protection
Prevent corrosion and its associated repair costs
Extend system life
Reduce overall cost of ownership to client: fewer repairs, no business downtime
Commonly required by codes, customers, and engineering specifications
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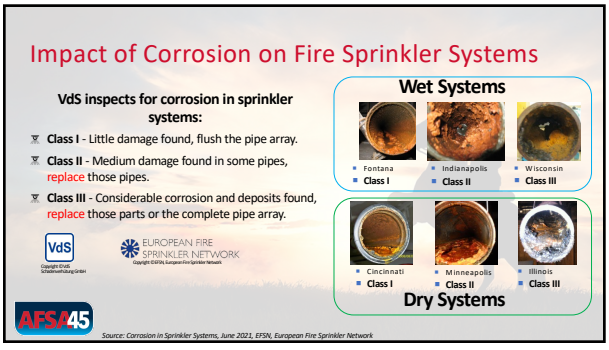
Impact of Corrosion on Fire Sprinkler Systems
VdS inspects for corrosion in sprinkler systems:
Class I - Little damage found, flush the pipe array.
Class II - Medium damage found in some pipes, replace those pipes.
Class III - Considerable corrosion and deposits found, replace those parts or the complete pipe array.
VdS
EUROPEAN FIRE SPRINKLER NETWORK
Wet Systems
Fontana
Class I
Indianapolis
Class II
Wisconsin
Class III
Cincinnati
Class I
Minneapolis
Class II
Illinois
Class III
Dry Systems
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Source: Corrosion in Sprinkler Systems, June 2021, EFSN, European Fire Sprinkler Network

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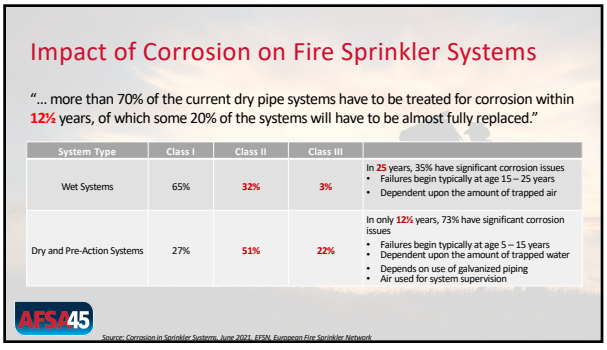
Impact of Corrosion on Fire Sprinkler Systems
"... more than 70% of the current dry pipe systems have to be treated for corrosion within 12½ years, of which some 20% of the systems will have to be almost fully replaced."
System Type | Class I | Class II | Class III
Wet Systems | 65% | 32% | 3%
In 25 years, 35% have significant corrosion issues
Failures begin typically at age 15 – 25 years
Dependent upon the amount of trapped air
Dry and Pre-Action Systems | 27% | 51% | 22%
In only 12½ years, 73% have significant corrosion issues
Failures begin typically at age 5 – 15 years
Dependent upon the amount of trapped water
Depends on use of galvanized piping
Air used for system supervision
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Source: Corrosion in Sprinkler Systems, June 2021, EFSN, European Fire Sprinkler Network

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Methods of Corrosion Mitigation

- Oxygen Removal
  - Nitrogen (dry and preaction systems)
  - Venting / wet inerting (wet systems)
  - Deoxygenation of water supply
- Chemical Corrosion Inhibitors
  - Liquid
  - Solid
  - Gas / vapor

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Code Required Testing

- NFPA 13
  - New system MIC testing (4.2.5, 5.1.4.1 – NFPA 13, 2025 edition)
  - Develop a plan with building owner, if MIC indicated
  - Technically, this responsibility falls to building owner, but point it out
- NFPA 25
  - Evidence of MIC observed during internal inspection requires testing (14.2.1.3 – NFPA 25, 2026 edition)
  - Inspection required every 5 years

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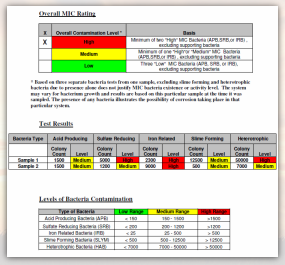
MIC Testing

Testing Provides Answers

- Test reports will identify colony counts of various bacteria in the samples
- Pipe sample testing gives definite results of cause (MIC vs Oxygen)
- Provides mitigation direction, particularly in wet systems



Overall MIC Rating

X	Overall Contamination Level*	Basis
X	High	Minimum of two "High" MIC Bacteria (APB,SRB,or IRB) , excluding supporting bacteria
	Medium	Minimum of one "High" MIC Bacteria (APB,SRB,or IRB) , excluding supporting bacteria
	Low	Three "Low" MIC Bacteria (APB, SRB, or IRB), excluding supporting bacteria

* Based on three separate bacteria tests from one sample, excluding slime forming and heterotrophic bacteria due to presence alone does not justify MIC bacteria existence or activity level. The system may vary for bacterium growth and results are based on this particular sample at the time it was sampled. The presence of any bacteria illustrates the possibility of corrosion taking place in that particular system.

Test Results

Bacteria Type	Acid Producing		Sulfate Reducing		Iron Related		Slime Forming		Heterotrophic	
	Colony Count	Level	Colony Count	Level	Colony Count	Level	Colony Count	Level	Colony Count	Level
Sample 1	1500	Medium	5000	High	2200	High	12500	Medium	20000	High
Sample 2	1600	Medium	1200	Medium	9000	High	160	Medium	7000	Medium

Levels of Bacteria Contamination

Type of Bacteria	Low Range	Medium Range	High Range
Acid Producing Bacteria (APB)	< 100	100 - 1000	>1000
Sulfate Reducing Bacteria (SRB)	< 200	200 - 1200	>1200
Iron Related Bacteria (IRB)	< 20	20 - 200	> 200
Slime Forming Bacteria (SLYM)	< 500	500 - 12500	> 12500
Heterotrophic Bacteria (HAB)	< 7000	7000 - 50000	> 50000

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Wet Systems: Air Venting

- NFPA 13 requires a single means of venting be installed for every wet sprinkler system
- Air vents eliminate trapped air reducing the amount oxygen available for corrosion
- Automatic air vents require little or no maintenance and speed filling / draining
- Automatic air vents eliminate guesswork and human error when filling wet systems

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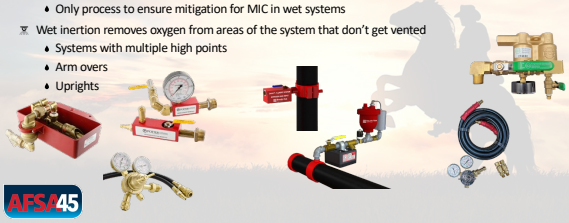
Wet Systems: Air Venting with Wet Inertion

- Air vents eliminate most but not all trapped air
- Wet inertion prefills wet sprinkler systems with nitrogen before water fills the systems
  - Only process to ensure mitigation for MIC in wet systems
- Wet inertion removes oxygen from areas of the system that don't get vented
  - Systems with multiple high points
  - Arm overs
  - Uprights



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Wet Systems: Auto-Testing

- Listed / Approved testing means without flowing water
  - No water flow from sprinkler system to exterior
  - No water flow from supply into system
- Reduces corrosion - No new oxygen introduced into the system during testing!
- Eliminates 5 of 6 actual water flow tests per NFPA 25 – Saves Water!

VSR-AT AutoTest Flow Switch

Zonecheck

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Dry / Preaction Systems: Auto-Testing

- Listed / Approved testing means
  - No large pressure losses to trip low air / high air supervisory switches
  - Eliminates air introduction to nitrogen interted systems reducing corrosion
- Eliminates risks of dry system trips saving time and costs for client

ATPS AutoTest Pressure Switch

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Chemical Corrosion Inhibitors

- A chemical additive used to slow metal oxidation rates by forming a protective barrier between the metal surface and corrosive elements
- Applied in various chemical forms
  - Liquid
  - Solid
  - Gas / vapor
- Effective in protecting sprinkler piping from corrosion

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Chemical Corrosion Inhibitors Considerations

- Must be listed or approved specifically for fire sprinkler systems per NFPA 13
- Understand the chemical components for compatibility and safety
  - MSDS (Material Safety Data Sheet) for potential hazards for storage, installation, testing, fire events
  - PPE for installation / service
  - Compatibility testing data
- Ensure plumbing code requirements for RPZ backflows are met – IPC, UPC both mandate RPZ backflows
- Consult local water jurisdiction for regulations on test water handling and disposal
- Understand complete system installation costs, long-term maintenance costs, and test water handling costs
- Understand testing process to ensure system is protected

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Dry & Preaction Systems: Nitrogen Generators

- Nitrogen generators replace the air with nitrogen, extending sprinkler system life
- Eliminates system repairs in mission critical application – saves client business downtime
- Eliminates moisture introduction by providing extremely low dew point nitrogen – ideal for freezer applications
- Nitrogen levels can be measured continuously to ensure systems are protected from corrosion

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Nitrogen Generators Considerations

- Understand installation, startup, and maintenance
  - Some end users require training on the equipment
  - Maintenance must be performed when needed
- Consider startup requirements and include those costs in bids
- If using NFPA 13 C-Value 120 in sprinkler system design, ensure systems measure nitrogen levels per NFPA 25
- Include power and low voltage wiring requirements for purging controls in bids
- Understand the pros and cons of remotely purging versus riser purging

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Dry & Preaction Systems: Nitrogen Generators

Corrosion Comparison Tests
(0.010" Leak Diameter)

Compressed Air

98% Nitrogen

20 Month Exposure

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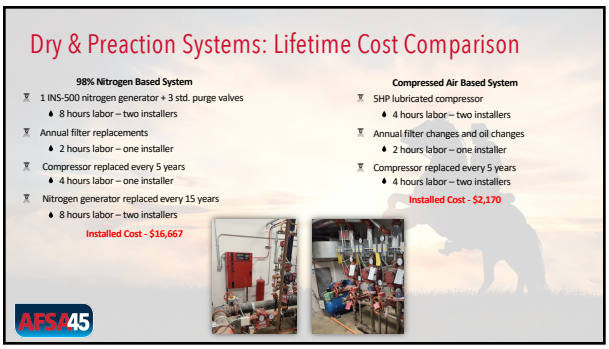

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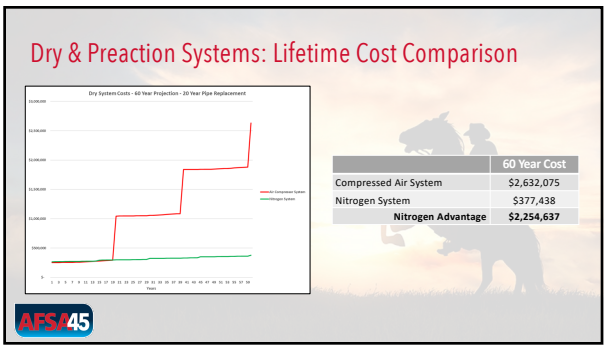

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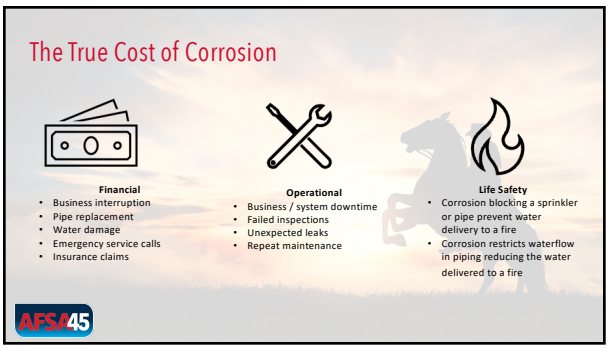

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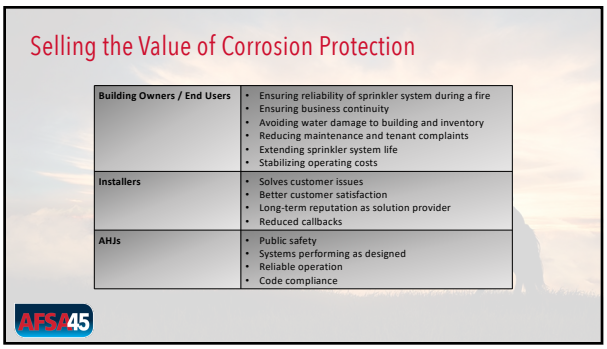

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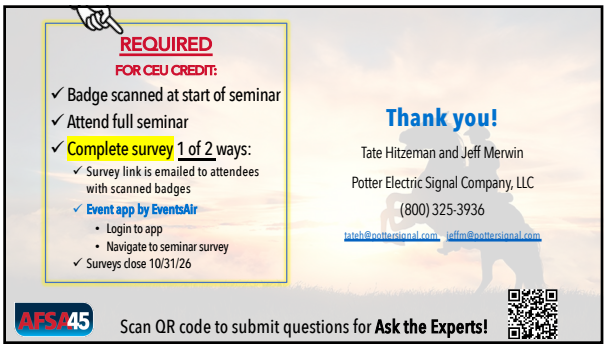

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2027 Training Schedule

WEBINARS

1/6	Updates to NFPA 20
1/20	Calculating Pressure Reducing Hose Valves
2/3	Consumer Alert: Nitrogen in Sprinkler Systems
2/17	Reviewing Hydraulic Calculations
3/3	Updates to NFPA 13, 2028 Ed.
3/17	Updates to NFPA 13R & 13D, 2028 Eds.
4/7	Topic Coming Soon
4/21	NFPA 25: Roles & Responsibilities
5/5	Standpipe Flow Test Procedures
5/19	Storage 101
6/2	NFPA Technical Meeting - Voting Guide
6/16	Topic Coming Soon
6/30	Topic Coming Soon
7/7	Updates to NFPA 14, 2027 Edition
7/21	Adjacent Hazards & Design Methods
8/4	Acceptance Testing
8/18	Modifications to Existing Systems
9/22	Topic Coming Soon
10/6	Seismic 101
10/20	Proposed Updates to NFPA 25, 2029 Ed.
11/3	Evaluating Fire Pump Flow Tests
11/17	Top 10 Tech Reviews
12/1	Designing Water Storage Tanks
12/15	Pump Room Layout

PROGRAMS

Feb 9 - Mar 5 Apr 20 - May 14 Aug 3 - Aug 27** Oct 26 - Nov 19	Beginning Design School*
Apr 26 - May 7 Nov 1 - 12	Intermediate Design School*
Feb 8 - 10** Apr 12 - 14 Jul 12 - 14 Oct 11 - 13	Sprinkler Hydraulics Calculations Workshop
Apr 19 - 21 Oct 18 - 20	Advanced Hydraulics Calculations Workshop
Feb 11** Apr 30 Jul 23 Sep 24	Introduction to the Fire Sprinkler Industry
Mar 1 - 3 May 17 - 19 Aug 16 - 18 Oct 18 - 20**	NFPA 25 Essentials Workshop
Jun 7 - 10 Sep 20 - 23	Experienced Inspector Skills Lab
Mar 4 - 5 May 20 - 21 Aug 19 - 20 Oct 21 - 22**	NFPA 25 Fire Pump Workshop
Spring Summer Fall	ITM Inspector Development Program* *This program is 20 months.*

** Hybrid course **At General Air Products Lab, Exton, PA*

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September 8-11	Manchester Grand Hyatt San Diego, CA

For More Details Visit:
firesprinkler.org

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Dates subject to change. Programs subject to minimum registrations.

rev 9/14/2026

Virtual Instruction Path (VIP)

for Sprinkler Fitting Apprentices

Level 1 - Begins January 2027

Level 2 - Begins February 2027

Level 3 - Begins January 2027

Level 4 - Begins March 2027

www.firesprinkler.org/VIP

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HANDS-ON WORKSHOPS FOR 2027

FEATURING AFSA'S TRAINING LAB

NFPA 25 Essentials Workshop

Mar | May | Aug | Oct

Description: Understand roles, responsibilities, and NFPA 25 ITM procedures through hands-on testing of wet systems, dry systems, and fire pumps.

NFPA 25 Fire Pump Workshop

Mar | May | Aug | Oct

Description: Develop practical NFPA 25 fire pump ITM skills, including no-flow and full-flow testing, water supply graphing, and performance evaluation.

Introduction to the Fire Sprinkler Industry

Feb | Apr | Jul | Sep

Description: This course is designed for those new to the industry. An introductory, wide-ranging 8-hour course that provides a broad overview of core fire sprinkler industry concepts for those new to the field.

Experienced Inspector Skills Lab NEW

Mar | Sep

Description: Take your ITM expertise beyond the basics. Designed for experienced technicians, this course combines focused classroom instruction with hands-on system lab training to strengthen your application of current NFPA 25 inspection, testing, and maintenance requirements. Refine fire sprinkler testing practices, improve documentation, deliver more consistent service, and help reduce liability while reinforcing knowledge commonly covered on certification exams.

Learn more about AFSA's fire sprinkler lab featuring functional risers, a spray room, fire pumps, and an interactive classroom.

firesprinkler.org/lab