LFP Antifreeze, Nitrogen Generator, and New Products

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- Post-webinar assessment
- Ask questions
- Chat window
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Portfolio of Flagship Brands

Learning Records

If you need copies of your records from class or the learning record policy, please contact Talya Pacheco:

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Cranston, RI 02910
Listed Antifreeze for Sprinkler Systems

April 2020

NFPA 13, 2019 Edition

Protection of Piping Against Freezing

(13:19, 16.4.1)

If systems cannot be maintained at or above 40°F (4°C):

Options for Protecting Piping Against Freezing
Addressing a Life Safety Concern

Serious Incidents Involving Antifreeze

1997: Bethel, ME
- Flash fire caused by vapors of propylene glycol-water solution interacting with natural gas fired heaters
- Fire extinguished when plain water discharged
- Occupants treated for smoke inhalation and thermal skin burns

2002: Monmouth, NJ
- A kitchen fire activated a sprinkler system containing glycerin-based antifreeze, which ignited the flames and caused a fireball
- Tenant fatality

2006: Denver, CO
2009: Truckee, CA
- Lit matches activated a sprinkler system containing polypropylene glycol
- One child and one adult suffered second- and third-degree burns

2010: Herriman, UT
- Lit matches activated a sprinkler system containing polypropylene glycol


Antifreeze Combustibility

Details
- Testing and Heat Release Rates
- Residential pendent, concealed and sidewall sprinklers
- K-factors between 3.1 and 7.4 tested
- Solutions of glycerin and propylene glycol were tested
  - Glycerin — from 50% – 70% concentration by volume
  - Propylene Glycol — from 40% – 60% concentration by volume

Findings
- Large-scale ignition was found to occur in various situations
  - 50% glycerin & 40% propylene glycol w/ HRR of 3.0 MW
  - 55% glycerin & 45% propylene glycol w/ HRR of 1.4 MW
  - >55% glycerin & >45% propylene glycol w/ HRR of <0.5 MW

Results
- Antifreeze Mixture
<table>
<thead>
<tr>
<th>Freezing Point</th>
<th>Density at 68°F</th>
<th>Energy Released</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>32°F</td>
<td>0.998 kg/l</td>
</tr>
<tr>
<td>Glycerin</td>
<td>-22°F</td>
<td>1.146 kg/l</td>
</tr>
<tr>
<td>Propylene Glycol</td>
<td>-22°F</td>
<td>1.062 kg/l</td>
</tr>
</tbody>
</table>

Fig. 1 – Materials at 45 cm
Fig. 2 – HRR vs. Time for water and 50% water/glycol
### Current Antifreeze Rules – NFPA 13, 13R & 13D, 25

<table>
<thead>
<tr>
<th></th>
<th>Propylene Glycol</th>
<th>Glycerin</th>
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<tbody>
<tr>
<td><strong>NFPA 13 (13:19, 8.6.2)</strong></td>
<td>Shall Be Listed for Use in Sprinkler Systems</td>
<td>Shall Be Listed for Use in Sprinkler Systems</td>
</tr>
<tr>
<td><strong>NFPA 25 installed prior 9/30/2012 (25:20, 5.3.4.4.1)</strong></td>
<td>Premixed Non-listed 30% by Volume Until 9/30/2022</td>
<td>Premixed Non-listed 38% by Volume Until 9/30/2022</td>
</tr>
<tr>
<td><strong>NFPA 25 installed after 9/30/2012 (25:20, 5.3.4.4)</strong></td>
<td>Listed Antifreeze</td>
<td>Listed Antifreeze</td>
</tr>
<tr>
<td><strong>NFPA 13R (13R:19, 5.4.2)</strong></td>
<td>Follow NFPA 13</td>
<td>Follow NFPA 13</td>
</tr>
<tr>
<td><strong>NFPA 13D (13D:19, 9.2.2)</strong></td>
<td>Listed or 38% When Deemed Acceptable by AHJ</td>
<td>Listed or 48% When Deemed Acceptable by AHJ</td>
</tr>
</tbody>
</table>

New listed solutions NOT required to be Glycerin- or Glycol-based, as long as they pass UL 2901

### UL 2901 Test Protocol for Antifreeze

**Performance**

- General
- Characterization Tests
- High Ambient Temperature Stability
- Temperature Cycling Stability
- Electrical Conductivity
- Corrosion Rate
- Pit Depth Corrosion
- Exposure to Elastomeric Materials
- Stress Corrosion
- Impact of Galvanic Action
- Compatibility with Polymeric Materials
- Toxicity
- Exposure to Fire
- Fire Fighting Effectiveness
- Viscosity at Temperature Limitations
- Resistance to Leakage

Test protocol recently finalized by UL, in development since 2011
Tyco LFP® Antifreeze

Listed for use in residential, commercial and storage applications*

**Benefits**
- Helps meet NFPA 13, 13R, 13D & 25
- Easy installation & maintenance
- Cost-effective

**Features**
- 5-gal. pail
- 30-gal. drum
- Compatible with most system materials
- Non-toxic
- Minimum use temperature: -10°F (-23.3°C)

*Not listed for extra hazard occupancies, flammable liquid protection or systems using ESFR Sprinklers

---

Minimum Use Temperature— the Correct Message for Installers

**Unlisted Solution Confusion**
Existing “unlisted” antifreeze reference multiple temperature values with no guidance on which to follow or what various temperatures mean.

**Listed Solution Clarity**
UL Standards call for Minimum Use Temperature: the value that allows the sprinkler system to operate as intended.

**Allowable Temperature Range:**
- Minimum Use Temperature: -10°F (-23.3°C)
- Max Use Temperature: 150°F (65°C)
Technical Details

Tyco LFP® Antifreeze
Pre-mixed antifreeze solution

- Appearance: Liquid, colorless
- Minimum Use Temperature: -10°F (-23.3°C)
- Refractive Index: 1.3960 – 1.3995
- pH: 7 – 8
- Specific Gravity: 1.122 – 1.129
- Electrical Conductivity: 1000 – 1400 microsiemens/cm
- Compatible Piping: CPVC, PEX, steel, brass, stainless steel, black steel, copper, cast iron, fusion bonded epoxy coated materials
- Compatible Materials: EPDM natural rubber, SBR, BUNA-N elastomeric materials

See Tech Data Sheet TFP1680 for full details

Installation and Maintenance Overview

New Systems
- Ensure system is air-tight
- Perform pressure test to 200 psi to ensure no leakages
- Test LFP® Antifreeze using a refractometer and/or hydrometer to demonstrate compliance to property ranges
- Fill system with LFP® Antifreeze
- Perform pressure test to 200 psi to ensure no leakages

Existing Systems
- Flush branch lines and mains to avoid contamination
- Perform pressure test to 200 psi to ensure no leakages
- Test LFP® Antifreeze using a refractometer and/or hydrometer to demonstrate compliance to property ranges
- Fill system with LFP® Antifreeze
- Perform pressure test to 200 psi to ensure no leakages
- Test the system again to verify solution is not diluted

Fluid Test
- Use a hydrometer or refractometer to test fluid annually, prior to cold weather

*Automatic sprinkler antifreeze systems to be inspected, tested and maintained by a qualified inspection, testing and maintenance service.

The acceptable property ranges of LFP® Antifreeze are:

<table>
<thead>
<tr>
<th>Concentration of LFP Antifreeze</th>
<th>Specific Gravity at Approximately 77°F (25°C)</th>
<th>Refractive Index at 77°F (25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1.122 – 1.129</td>
<td>1.396 – 1.3995</td>
</tr>
</tbody>
</table>

*Annual calibration of test equipment is required
*See TFP1680 for suggested tools
Tyco LFP® Antifreeze

Testing Requirements and Usage Limitations

Testing Requirements

Same installation/maintenance requirements as existing antifreezes per NFPA 13 and 25.

It is recommended that automatic sprinkler antifreeze systems be inspected, tested and maintained by a qualified inspection, testing and maintenance service annually, prior to cold weather.

Tools to use for testing antifreeze solution:
- Digital refractometer
- Hydrometer and thermometer in appropriate graduated cylinder

Volume Limitations

<table>
<thead>
<tr>
<th>NFPA 13D</th>
<th>NFPA 13R</th>
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</thead>
<tbody>
<tr>
<td>• No volume limitations</td>
<td>• No volume limitations</td>
</tr>
<tr>
<td>• Antifreeze may only be used in above-ground piping</td>
<td>• Dwelling-only buildings are limited to above-ground use of antifreeze</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>NFPA 13R</th>
<th>Mixed-Use Occupancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No volume limitations for system size in buildings containing only dwellings</td>
<td>• System size limitation of 40 gal. for sprinkler systems in non-dwelling buildings</td>
</tr>
<tr>
<td>• System size limitation of 40 gal. in mixed-use occupancies fed by a single sprinkler system</td>
<td>• If future building renovations result in occupancy classification changes, a fire sprinkler system evaluation must be performed to determine if any changes are required for the use of antifreeze</td>
</tr>
<tr>
<td>• Only above-ground piping may be filled with antifreeze</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NFPA 13</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Buildings with occupancy classifications of Light Hazard and Ordinary Hazard Group 1 and 2 are limited to a sprinkler system volume of 40 gal.</td>
<td>• Storage applications using non-ESFR sprinklers are limited to a sprinkler system volume of 40 gal.</td>
</tr>
<tr>
<td>• Storage applications using non-ESFR sprinklers are limited to a sprinkler system volume of 40 gal.</td>
<td>• LFP® antifreeze is not listed for use in protecting Extra Hazard occupancies, flammable liquids or use with ESFR sprinklers.</td>
</tr>
</tbody>
</table>

Common Misconceptions

Antifreeze is....

**Toxic**
- Tyco LFP® Antifreeze is:
  - Safe
  - Non-toxic*
  - Easily disposed of at local waste water treatment centers

*For the purposes of this product, non-toxic means that acute exposure to ingredients in the LFP™ Antifreeze does not pose a risk of adverse effects in humans or the environment following short-term exposure.

**Expensive**
- Tyco LFP® Antifreeze is:
  - A very cost-effective way to protect a piping system from cold environments
  - Alternatives, such as dry pipe systems and heat tracing, can:
    - Be expensive
    - Require monitoring
    - Require maintenance
    - Create design challenges in some situations

**Hard to Work With & Maintain**
- Tyco LFP® Antifreeze is:
  - Easy to install and compatible with most common fire protection piping system materials using a small pump

Following NFPA 25, the system can be quickly checked annually and does not need to be replaced unless the material is diluted or out of spec.
Resources

Visit [www.tyco-fire.com/LFP](http://www.tyco-fire.com/LFP) for more information.

Resources

LFP® ANTIFREEZE

Easy to use
Cost Effective
Safe
Certified

UL LISTED
Poll Question 1

What is the minimum use temperature of Tyco LFP?

a. 32 degrees F
b. 40 degrees F
c. -10 degrees F
d. -60 degrees F
Learning Objectives

- Discuss the issue of corrosion in water based fire protection systems
- Outline the Tyco NG-Series Product
- Identify the use of nitrogen generation for dry pipe system inerting.
- Describe the use of nitrogen in wet pipe systems and air venting.
- Recognize Corrosion Monitoring solutions and the technical information used with the Tyco Model NG series nitrogen generators
The Corrosion Triangle

- Corrosion requires three components:
  - Water
  - Metal
  - Oxygen

- Fire sprinkler systems typically have all three:
  - **WATER**: Water in the pipes and/or the moisture in compressed air
  - **METAL**: The galvanized or black steel pipe
  - **OXYGEN**: Compressed air (Dry/Preaction); Trapped air (Wet)

The Impact of Corrosion

- Corrosion damage in a fire protection system can cause pinhole leaks or partial/full system blockages.

  **Pinhole Leaks**
  - Damage property (structures, inventory, etc…)
  - Interrupt business during repairs/replacement
  - Increase expected system-maintenance costs

  **Partial/Full System Blockages**
  - Reduce water flow capacity
  - Clog sprinklers, preventing them from spraying properly
  - Increase the risk of an uncontrolled fire loss
Why are Fire Sprinkler Systems Prone to Corrosion?

The fire sprinkler industry has several practices which accelerate the impact of corrosion.

- **Widespread use of thin-wall branches**
  - Thinner metal has the potential to develop pinhole leaks more quickly, accelerating repair/replacement timelines.

- **Galvanized pipe for dry/preaction**
  - Galvanized coating can flake off which allows for highly-localized corrosion causing pinhole leaks.

- **Grid design – branch lines elevated**
  - Trapped air at the high points will cause corrosion at the air-water interface.

- **Trapped water in all dry pipe systems**
  - Impossible to remove all water from a dry system – corrosion reaction only requires a small amount.

- **Code-mandated system testing**
  - Testing reintroduces fresh oxygen to the system which restarts the corrosion process.

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Air Venting and Nitrogen Inerting

Removing the oxygen is the most effective way to reduce corrosion in fire sprinkler systems. Our Corrosion Solutions program will cover the following options:

- **Air Venting**
  - By venting the trapped air in wet systems, you reduce the corrosion. It’s a linear reaction – vent 50% of the trapped air, reduce corrosion by 50%.

- **Nitrogen Inerting**
  - Nitrogen is an inert gas and will not react with metal and water to cause corrosion. If you replace the oxygen with nitrogen, you will stop the corrosion process.

- **Dry Pipe Nitrogen Inerting (DPNI)**

- **Wet Pipe Nitrogen Inerting (WPNI)**
NFPA References

  - Chapter 4: General Requirements
  - Chapter 5: Water Supplies
  - Chapter 8: System Types and Requirements
  - Chapter 28: System Acceptance

  - Chapter 13: Common Components and Valves

Dry Pipe
Nitrogen Inerting
There are three essential components to the TYCO Dry Pipe Nitrogen Inerting process.

- Continuous source of nitrogen capable of 98%+ purity – nitrogen generator
- Oxygen removal vent to facilitate removal of oxygen from the dry piping system
- A fill/purge method to facilitate removal of oxygen from dry system

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**NG-1 Nitrogen Generators – Features & Benefits**

- Wall-mount, skid-mount, or stand-alone configurations
- Can serve one or more systems from a single location
- FM Approved / CE Marked
- No nitrogen storage tanks or refrigerated air dryers
- Standard alarm signals
  - Air bypass mode
  - Excessive runtime / leak monitoring
- Standard monitoring points
  - Nitrogen generator loss of power
  - Air bypass mode
  - Nitrogen generation mode
  - Excessive runtime / leak monitoring
NG-1 Nitrogen Generators

Control Panel
Filters
Nitrogen Membrane

NG-1 Nitrogen Generators – Available Options

<table>
<thead>
<tr>
<th>Total System Capacity (Gal)</th>
<th>NG-1 100</th>
<th>NG-1 250</th>
<th>NG-1 500</th>
<th>NG-1 1000</th>
<th>NG-1 1150</th>
<th>NG-1 1500</th>
<th>NG-1 2000</th>
<th>NG-1 3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gal (L)</td>
<td>875 (3355)</td>
<td>900 (3506)</td>
<td>2000 (7571)</td>
<td>3200 (12113)</td>
<td>6000 (24000)</td>
<td>11000 (41640)</td>
<td>18500 (70030)</td>
<td>22500 (85172)</td>
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<tr>
<td>Single System Capacity @ 40 psi (2.75 bar)* (Gal)</td>
<td>215 (814)</td>
<td>265 (1003)</td>
<td>560 (2120)</td>
<td>950 (3596)</td>
<td>1150 (4353)</td>
<td>1440 (5451)</td>
<td>2025 (7666)</td>
<td>2900 (10978)</td>
</tr>
<tr>
<td>Single System Capacity @ 20 psi (1.4 bar)* (Gal)</td>
<td>540 (2044)</td>
<td>590 (2233)</td>
<td>1120 (4240)</td>
<td>1800 (6814)</td>
<td>2300 (8706)</td>
<td>2880 (10903)</td>
<td>4050 (15331)</td>
<td>5800 (21955)</td>
</tr>
<tr>
<td>Air Compressor</td>
<td>Integral Oil-Less</td>
<td>Oil Lubricated</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Configuration</td>
<td>Wall Mount</td>
<td>Skid Mount</td>
<td>Stand Alone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

UL 268A Listed Industrial Control Cabinet

*Single system capacity based on 30 min. 60% improvement of largest single sprinkler system. A dedicated air compressor with normally closed isolation valve can be used to meet 60% requirement for larger individual systems.
Air Vents – Dry Systems

TYCO Dry Pipe Nitrogen Inerting requires one oxygen-removal vent for each system being supported by a Nitrogen Generator. TYCO Dry vent features include:

- Designed to be mounted at the riser
- Listed float valve to prevent water discharge
- In-line filter to protect restricted orifice
- Pressure regulating device provides fail-safe to prevent accidental depressurization of the sprinkler system

To complete the 14-day DPNI process, there are two vent options available:

- **TAV-D** Oxygen Removal Vent – Manual Shut-off
- **TSV-D** Oxygen Removal Vent – Electronic Shut-off

“Fill-and-Purge” Breathing Method

**Fill Cycle**
The nitrogen gas is pushed deep into the piping network no matter how complex it is.

This action causes dynamic mixing of all gas within the piping – homogenization of the atmosphere.

**Purge Cycle**
When the nitrogen filling stops, and venting starts, all of the gas in the piping moves toward the vent.

With each successive fill and purge cycle, the corrosive oxygen gas is diluted further.

Over a 14-day period, the oxygen gas is removed which inerts the atmosphere in the pipe.
Dry Pipe Nitrogen Inerting

“Fill-and-Purge” Breathing Method
• Achieves 98% Nitrogen purity throughout entire fire sprinkler system
• Allows you to install vent directly on riser — faster, easier installation
  • No need to install vents at far points of system
• Eliminates need for nitrogen tank — reduces equipment footprint

TYCO NG-1 Nitrogen Generators
• Use nitrogen membrane technology which eliminates need for refrigerated air dryers
• Can support multiple systems at the same time
• Are available as pre-engineered units to minimize installation time

Ordering Process – Nitrogen Generators (DPNI)
• To ensure the nitrogen generator is appropriately sized and you have all required components, customer will need to provide the following details:
  • Total cumulative size of all dry/preaction sprinkler systems
  • Size of the largest single dry/preaction sprinkler system
  • Total number of dry/preaction sprinkler systems
  • Supervisory pressure of all dry/preaction sprinkler systems
  • Voltage requirements for electrical connections
  • Do they require manual or automatic air vents for each system?

One (1) THGA analyzer (sold separately) per generator
One (1) oxygen-removal vent per system being supported by generator
TAV-D or TSV-D Oxygen-Removal Vents

Johnson Controls
Wet System Air Venting

Corrosion in Wet Systems – Look for the Trapped Air
Corrosion in Wet Systems – Trapped Air (Gridded Center Pitched)

Trapped Air

Hot Spot at the air/water interface

Corrosion in Wet Systems – Trapped Air (Pitched, Back to Front)

Trapped Air

Trapped Air
Air Vents – Wet Systems

• Since trapped air is the primary source for oxygen being in a wet system, you can reduce corrosion by venting the trapped air.
  • Install a vent in a level position at an accessible high point on the sprinkler system where trapped gas can be vented
  • For higher-levels of corrosion protection, follow the Wet Pipe Nitrogen Inerting process.

• There are two vent options – depending if you are going to use Nitrogen to protect against corrosion:
  • TAV-W Oxygen Removal Vent – Wet Systems
  • TAV-WN Oxygen Removal Vent – Wet Pipe Nitrogen Inerting

Remove 50% of the trapped air from a wet system and you will reduce corrosion activity by 50%!

TAV-W Automatic Wet Vent

• Redundant automatic reset design
• No requirement to plumb to drain
• Easily convertible to TAV-WN for wet pipe nitrogen inerting

Codes/standards are changing to address corrosion in wet pipe systems.

NFPA 13, 2016/2019 Editions
Single air vent shall be provided on each wet pipe system

FM Global Data Sheet 2-1
2.2.1.8 Remove trapped air from wet-pipe sprinkler systems
  • Install minimum 1/2" FM Approved automatic air-release valve OR
  • Install FM Approved manual valve at system high points
There are three essential components to the TYCO Wet Pipe Nitrogen Inerting process.

- **Nitrogen source** capable of 98%+ purity – nitrogen cylinders or nitrogen generator
- **Oxygen removal vent** to facilitate removal of oxygen from the wet piping system
- **Proven protocol** to displace oxygen gas with nitrogen
TYCO Wet Pipe Nitrogen Inerting (WPNI)

- TYCO Wet Pipe Nitrogen Inerting provides a higher level of corrosion protection than simply venting air from a wet system.
  - Manual pressure cycling with nitrogen gas removes corrosive oxygen
  - Any gas which remains in the system is not corrosive
  - WPNI pressure cycling process is accomplished over 2-3 hours so system can quickly be returned to service

**Key Products**

- **TAV-WN**
  - Oxygen Removal Vent – Wet Pipe Nitrogen Inerting

- **TNIP**
  - Nitrogen Injection Port (Nitrogen cylinder regulator; 25-ft hose; included with TAV-WN, or sold separately)

- **TNIK**
  - Nitrogen Inerting Startup Kit

- **THGA**
  - Handheld Gas Analyzer

**Wet Pipe System Comparison**

- Untreated System
- WPNI Treated System
Poll Question 2

Choose the best response to fill in the blank.

NG-1 nitrogen generators prevent corrosion in ____________.

- a. deluge systems
- b. wet pipe systems
- c. dry type systems
- d. wet and dry type systems
TYCO In-Line Corrosion Detector

- Installs in-line with piping system
- Roll grooved ends for easy installation
- Available in diameters: 1-1/4” to 8”
  - Schedule 10 or 40
  - Black Steel or Galvanized

Advantages

- Real-time early warning system
- No obstruction issues to interfere with system flow
- 360° exposure of pipe surface to corrosion

In-Line Corrosion Detector – Dry System Installation

- Installed where corrosion is most likely to occur
  - Low-point mains
In-Line Corrosion Detector – Wet System Installation

- Installed where corrosion is most likely to occur
  - High-point branch lines

Technical Data / Part Numbers
### Technical Data Sheets

- Data sheets available on [www.tyco-fire.com](http://www.tyco-fire.com)

#### Data Sheet Models Subject

<table>
<thead>
<tr>
<th>Data Sheet</th>
<th>Models</th>
<th>Subject</th>
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<tbody>
<tr>
<td>TFP1251</td>
<td>NG-1 100, 250, 500</td>
<td>Nitrogen Generators - Wall Mount</td>
</tr>
<tr>
<td>TFP1252</td>
<td>NG-1 1000, 2000</td>
<td>Nitrogen Generators - Wall Mount</td>
</tr>
<tr>
<td>TFP1253</td>
<td>NG-1 100, 250, 500</td>
<td>Nitrogen Generators - Stand Alone</td>
</tr>
<tr>
<td>TFP1261</td>
<td>TFP1261</td>
<td>In-Line Corrosion Sensor</td>
</tr>
<tr>
<td>TFP1262</td>
<td>TFP1262</td>
<td>Oxygen Removal Vent, Dry Systems - Manual</td>
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<td>TFP1263</td>
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<td>TFP1264</td>
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<td>TFP1268</td>
<td>TFP1268</td>
<td>Nitrogen Inerting Kit</td>
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<tr>
<td>TFP1269</td>
<td>THGA</td>
<td>Handheld Gas Analyzer / Gas Sampling Port</td>
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<td>TFP1270</td>
<td>TFP1270</td>
<td>Nitrogen Inerting Manifold</td>
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<td>TFP1271</td>
<td>TFP1271</td>
<td>Nitrogen Interface Controller</td>
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<td>TFP1272</td>
<td>TFP1272</td>
<td>Smart Gas Analyzer</td>
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<tr>
<td>TFP1273</td>
<td>TFP1273</td>
<td>Nitrogen Inerting - 200 gal</td>
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### NG-1 Installation Manuals

**NG-1 300/NG-2 300 Installer's Manual**

**NG-1 300/NG-3 500/NG-2 500 Installer's Manual**

**NG-1 1000/NG-2 1000/NG-2 1500/NG-2 2000 Installer’s Manual**
TYCO® Series EC-8C Exposed Corridor Sprinkler

March 2020

Extended Coverage Sprinklers Characteristics

- Provide larger areas of coverage compared to standard coverage sprinklers
- Maximum coverage area is 400 ft² as restricted by NFPA 13
- Typically used in
  - Hotels
  - Restaurants
  - Office Buildings
TY4282 Sprinkler Details

- Designed for use in corridors and hallways
- Quick Response
- Max Coverage: 28 ft x 10 ft (8.5m x 3.1m)
- UL Listed
- Extended Coverage
- Pendent and Recessed Pendent options
- Light Hazard Occupancies

EC-8C Technical Details

- K-Factor: 8.0 gpm/psi½ (115.2 lpm/bar½)
- Max Operating Pressure: 250 psi (17.2 bar)
- Recess: 1/2 inch (Style 30 Escutcheon)
- 3/4 inch (Style 40 Escutcheon)
- Pipe Thread Connection: ¾ inch NPT
- Sensitivity: Quick Response
- Operating Temperatures: 155°F (68°C)
- 200°F (93°C)
Fewer sprinklers and lower system pressure demands are required as compared to traditional extended coverage sprinklers.
Sprinkler Coverage

- Requires fewer sprinklers at lower pressures compared to current alternatives
- Minimum allowable spacing is 12 feet in the long spray direction

See Tech Data Sheet TFP 226 for full details

Sprinkler Coverage and Orientation

- The Series EC-8C Pendent Sprinklers are not to be installed with the short spray direction oriented towards another Series EC-8C Pendent Sprinkler’s short spray direction

<table>
<thead>
<tr>
<th>Description</th>
<th>Coverage Area</th>
<th>Flow Rate</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV4222 (Pendent)</td>
<td>28 ft x 8 ft (8.5 m x 2.4 m)</td>
<td>23 gpm (89 l/min)</td>
<td>8.5 psi (59.8 kPa)</td>
</tr>
<tr>
<td>TV4222 (Pendent)</td>
<td>28 ft x 10 ft (8.5 m x 3.1 m)</td>
<td>29 gpm (110 l/min)</td>
<td>12.0 psi (82.7 kPa)</td>
</tr>
</tbody>
</table>

Notes: For coverage area dimensions less than or between listed, use the minimum flow required for the next higher design area.
Finishes, Coatings, & Installation Tools

- **Sprinkler**: Natural Brass, Signal White Polyester Coated, Pure White Polyester Coated, Jet Black Polyester Coated, or Chrome Plated
- **Recessed Escutcheon**: Natural Brass, Signal White, Pure White, Jet Black, Chrome Plated

**Sprinkler Wrenches:**

- W-Type 6
- W-Type 7 Recessed

Poll Question 3

*What is the benefit of utilizing the EC corridor sprinkler?*

- **a.** It is aesthetically pleasing.
- **b.** It is the perfect shape to hang decorations off of.
- **c.** It allows for a more efficient design, with less sprinklers.
Model CWS Window Sprinkler

Special Application
Concealed Pendent Vertical Sidewall
5.6 K-Factor

Why Utilize an Automatic Window Sprinkler?

- Even coating of water over the pane for proper protection
- Allow for a 2-hour equivalent rated glazing unit utilizing automatic sprinklers
- More cost effective
Window sprinklers are used to protect a variety of glazing assemblies including:

- single-glazed (single pane)
- double-glazed (double pane)
- insulated
- non-operable heat-strengthened
- tempered
- stronger glass window assemblies where each individual pane is a minimum 1/4” (6 mm) thick.

Window sprinklers allow for the use of clear glass as opposed to tinted fire-rated glass or wire mesh glass. Also, fire-rated glass is generally heavier and more costly than regular glass.
**Glass Types to be used with Window Sprinklers**

- Model CWS Window Sprinkler

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**Window Types That Can Be Protected Using Window Sprinklers**

Tyco Window Sprinklers can only be used on fixed vertical glass windows.

So, NO...

- Sloped glass windows - regardless of how little the slope is.
- Doors - regardless of the size or location cannot be protected.
- Operable windows, if the window opens at all, then it cannot be protected.
- Glass windows with a horizontal or intermediate mullion.*

*Refer to next slide for exceptions.

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- Sloped glass window
- Operable Windows
- Glass Doors
- Windows with horizontal or intermediate mullions

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Window Types That Can Be Protected Using Window Sprinklers

Minimum Clearance from Face of Glass to Combustible Materials
For glass types other than FIRELITE PLUS CWS ceramic glass by TGP, all combustible materials shall be kept 2 in. (50.8 mm) from the front face of the glass. This can be accomplished by a minimum 36 in. (914.4 mm) pony wall or other method acceptable to the authority having jurisdiction.

Model Concealed Window Sprinkler
Vertical Sidewall Window Sprinkler

Horizontal Sidewall Window Sprinkler
Lot Line Protection

Poll Question 4

What is the window sprinkler utilized for?

a. To provide a 2-hour equivalent fire resistance rating to window assemblies.
b. To protect combustibles pushed against the window.
c. It allows for a more efficient design, with less sprinklers.
d. They are a supplement to window washers.
New Concealed Sprinklers

RFII-MRI

- 5.6K Concealed Pendent Sprinkler
- 155°F Sprinkler/139 °F Plate
  200°F Sprinkler/165°F Plate
- Quick Response
- Standard and Extended Coverage Offerings

- TFP182 Standard Coverage
- TFP262 Extended Coverage F

MR Conditional
In a static
magnetic field
of 7-Tesla or less
**LFII Intermediate Temperature Residential**

- 4.9K
- 212°F Sprinkler/ 165°F Plate
- Reduced Gap
- 10 standard colors with Custom Options

**INTERMEDIATE TEMPERATURE RATING**

---

**RFIII Extended Coverage Horizontal Sidewall Sprinkler**

- 8.0K
- Quick Response
- 160°F Sprinkler/ 139°F Plate
- Reduced Gap/ ¼” Adjustment
- Up to 24-foot Extended Coverage Throw

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Model BFV-300 Indicating Butterfly Valve

- Pre-assembled in normally open or closed states
- Two factory-plugged NPT threaded tapping bosses in the valve body are located on the up- and downstream sides of the disc for connection to valve trim
  - 2in. –3 in. . . . . . . . . . . . . 3/8 NPT
  - 4in. –12 in. . . . . . . . . 1/2 NPT
- Tapping Bosses Great for Deluge/ Pre-action Priming and Fire Pump Sensing Line
Model CV-300B Grooved Swing Check Valve

- Light-weight
- Cost-effective
- 4"
- Maximum Working Pressure: 300 psi

For fire protection pressure rating, listing and approval information, contact your TYCO representative.

Other Automatic Sprinklers

- TN-17
- ESFR-22
- TY-B and TY-FRB Poly-Stainless
Fittings

- Rapid Seal Adapter
- G-Fire One Bolt Coupling

Questions?
Thank You!!!!

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Or contact JCI Technical Services at TechServ@jci.com
1-800-381-9312

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