



FireFighter® ELIMINATOR 1330™

FBC™ System Compatible indicates that this product has been tested, and is monitored on an ongoing basis, to assure its chemical compatibility with FlowGuard Gold®, BlazeMaster® and Corzan® piping systems and products made with TempRite® Technology.

Antifreeze Solutions for Use in Fire Sprinkler Systems
File #EX28252

Design and Installation Instructions

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DESIGN CRITERIA

ELIMINATOR 1330 Antifreeze is a pre-mixed solution tested and listed by UL for use in wet fire sprinkler systems. Instructions and test parameters should be followed completely to ensure the longest solution longevity. All fire protection systems shall conform to state, local, and NFPA requirements if employing the use of ELIMINATOR 1330 Antifreeze. Layout and design flow rates, pipe sizing, sprinkler spacing, hanging methods, and system design must be in accordance with NFPA 13, 13R, and 13D. Fire sprinkler systems utilizing ELIMINATOR 1330 Antifreeze shall meet the system size limitations, as shown in **Table 1**. ELIMINATOR 1330 is a non-toxic antifreeze solution designed specifically for use in wet fire sprinkler systems. Use in place of water in sprinkler systems where freezing may either cause damage or interfere with the functioning of systems or equipment and/or toxicity to humans or animals is a concern. **Non-toxic means the antifreeze does not pose a risk of adverse effects in humans or the environment following short-term exposure in scenarios related to fire sprinkler system installation, maintenance, and discharge.**

NOTICE

ELIMINATOR 1330 Antifreeze is not listed for use in protecting extra hazard occupancies, flammable liquids, or use with ESFR sprinklers.

COMPATIBILITY

The following materials are compatible with Eliminator 1330: Steel Piping, Brass Materials, Stainless Steel Piping, Black Steel, Copper, Bronze, Cast Iron, CPVC, Pex, EPDM, Natural Rubber, Nitrile Rubber, Styrene Butadiene Rubber, Fusion Bonded Epoxy Coated Ductile Iron, Butyl Rubber



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HYDRAULIC CALCULATION REQUIREMENTS FOR ANTIFREEZE INSTALLATION INSTRUCTIONS

The viscosity of the antifreeze solution at lowest anticipated temperatures shall be considered in the hydraulic design for all systems using antifreeze. Pipe sizing shall be determined using both the Darcy-Weisbach and Hazen-Williams approved hydraulic calculations. Because of the density of antifreeze, the K-factor must be adjusted and the friction loss must be considered in the system design.

For all systems, the following requirements shall apply:

- The use of the antifreeze solution is limited to the aboveground system piping only except for a limited length of underground piping that connects sections of the aboveground system.
- The viscosity of the antifreeze solution at the lowest anticipated temperature of the system shall be considered in the hydraulic design.
- The friction loss shall be determined using the Hazen-Williams formula for water and the Darcy-Weisbach formula to account for the antifreeze solution fluid properties.
- The K-factor of the sprinkler shall be adjusted to account for the density of the antifreeze.

The flowing pressures are to be based upon a K-factor calculated using the following equation:

$$K_A = 7.94K_W \sqrt{\frac{1}{\nu_A}}$$

Where:

K_A = Sprinkler K-factor discharging the antifreeze solution

K_W = Sprinkler K-factor discharging water

ν_A = Density of the antifreeze solution at the temperature used for testing, lbs./ft³

Note: See **Table 3** for density in lb/ft³.

MINIMUM DESIGN PRESSURE

The minimum design pressure of the sprinkler system must be the minimum required pressure for the sprinklers used. A minimum 20 PSI is required at temperatures below -13.3°F (-25.1°C) at the most hydraulically remote sprinkler.

FLUID SAMPLING VALVE CONNECTION

The riser must be installed in an area not subject to freezing with a minimum temperature of 40°F (4,4°C). A fluid sampling valve connection must be located at the top of each system riser. The sampling valves should be located for ease of access to the valve by contractors. The sampling connection will facilitate implementing the service requirements outlined in the Maintenance section.

FLUID CONTRACTION AND EXPANSION

Fluids expand and contract when exposed to changes in temperatures, resulting in changes in fluid density. Thermal expansion shall be taken into account when designing or retrofitting a sprinkler system using ELIMINATOR 1330 Antifreeze to size the expansion tank. **Table 1** shows the thermal expansion or contraction of the solution at different temperatures in sprinkler system volumes, using the equation for sizing the expansion chamber due to thermal expansion in NFPA 13. These values and the NFPA 13, 13R, and 13D Standards for the Installation of Sprinkler Systems can be used by the installer to determine the proper expansion or contraction arrangement of a sprinkler system containing ELIMINATOR 1330 Antifreeze.

EXPANSION EXAMPLE

A sprinkler system containing 50 gal (189 L) of ELIMINATOR 1330 Antifreeze is subjected to an environmental temperature of 0°F (-18°C) in the winter months and an increase of system temperature to 100°F (38°C) in the summer months, or a temperature change of 100°F (38°C). This results in fluid expansion of approximately 2 gal (8 L).

CONTRACTION EXAMPLE

A sprinkler system containing 300 gal (1136 L) of ELIMINATOR 1330 Antifreeze is subjected to an environmental temperature of 70°F (21,1°C) with a later decrease in system temperature to -10°F (-23,3°C), or a temperature change of 80°F (27°C). This results in a fluid contraction of approximately 9.2 gal (35 L).

EXPANSION TANK

Reference NFPA 13 for guidance on the addition of expansion tanks in new and existing systems. Vessel sizing should be based on the anticipated operating conditions the system will experience. An expansion tank is highly recommended for all systems (including existing). Without an expansion tank there is potential for water to enter the system which can alter the performance of ELIMINATOR 1330 Antifreeze.

Reference NFPA 13, System Requirements of Antifreeze Systems for alternate methods.

STORAGE

Store the product in original container and at a temperature between 40°F (4,4°C) minimum and 90°F (32,2°C) maximum. Do not mix the product with other liquids. Eye and hand protection are recommended when handling the antifreeze solution.

INSTALLATION

ELIMINATOR 1330 Antifreeze is pre-mixed at the factory per NFPA 13, 13R, 13D. Do not dilute ELIMINATOR 1330 Antifreeze with water. Diluting with water or other constituents in the field can adversely impact the properties and performance of the solution. The functional life of the solution may be impacted by the end use environmental conditions. Only use antifreeze in closed systems as oxygen can contribute to an increased rate of corrosion and require fluid to be changed more frequently.

NEW SYSTEMS

Use the following guidelines when preparing a new sprinkler system for ELIMINATOR 1330 antifreeze installation:

1. **THE SYSTEM SHALL BE INSTALLED** with materials as indicated in the compatibility list.
2. **VERIFY THE REQUIRED BACKFLOW PREVENTION** and cross connection control is in accordance with state and local requirements.
3. **THE SYSTEM SHALL BE OUTFITTED** with air vent valve(s) and fluid sampling valve connections as required by the applicable NFPA standard.
4. **THE SYSTEM SHOULD BE DETERMINED TO BE AIRTIGHT** prior to introducing ELIMINATOR 1330 antifreeze into the system to prevent loss or spillage of product.
5. **A PRESSURE TEST SHALL BE CONDUCTED** in accordance with the applicable NFPA standard. This pressure test may be performed with water or ELIMINATOR 1330 antifreeze. It is recommended that systems with drops be tested with ELIMINATOR 1330 antifreeze to prevent the accumulation of water in the drops. Note: The water shall be completely removed from the system prior to introducing ELIMINATOR 1330 Antifreeze to the system.
6. **FOR SYSTEMS HYDROSTATICALLY TESTED WITH WATER**, the system must be drained after the test in accordance with the applicable NFPA standard.
7. **IT IS RECOMMENDED THAT PRIOR TO FILLING THE SYSTEM** with ELIMINATOR 1330 antifreeze, the antifreeze is tested to verify that the specific gravity or refractive index is within the ranges specified in **Table 2**. If the antifreeze solution is from a new, unopened factory container, this test verification is not required. If the solution is discolored or the container has dirt present, contact Customer Services.
8. **FILL THE SYSTEM WITH ELIMINATOR 1330 ANTIFREEZE**. Avoid the use of contaminated hoses and equipment that have come into contact with fluids other than ELIMINATOR 1330 antifreeze or water. The use of a pump with a backflow preventer and pressure capabilities to get the system to the supply pressure is recommended. For ELIMINATOR 1330 antifreeze to work correctly, purge as much air as possible from the system. Accelerated corrosion may occur where air pockets exist in the system.
9. **AFTER FILLING THE SYSTEM WITH ELIMINATOR 1330 ANTIFREEZE**, test samples from the system to verify the solution has not been diluted. Take samples of the solution from a high and low point in the system. If not done so beforehand with water, perform the hydrostatic pressure test as applicable.

EXISTING SYSTEMS

Use the following guidelines when preparing an existing sprinkler system for ELIMINATOR 1330 antifreeze installation:

1. **INSPECT ALL SPRINKLERS** for mechanical damage, corrosion, and evidence of leakage. If any of these conditions are present, replace the sprinkler per NFPA 25.
2. **VERIFY THE REQUIRED BACKFLOW PREVENTION** and cross connection control is in accordance with state and local requirements.
3. **THE SYSTEM SHOULD BE AIRTIGHT** to prevent leakage. Air vents are recommended to reduce the oxygen in the system.
4. **DRAIN THE EXISTING ANTIFREEZE** from the system in accordance with NFPA 25. Flush with water and drain.
5. **IT IS RECOMMENDED THAT PRIOR TO FILLING THE SYSTEM** with ELIMINATOR 1330 antifreeze, the antifreeze is tested to verify that the specific gravity or refractive index is within the ranges specified in **Table 2**. If the antifreeze solution is from a new, unopened factory container, this test verification is not required. If the solution is discolored or the container has dirt present, contact Customer Services.
6. **FILL THE SYSTEM WITH ELIMINATOR 1330 ANTIFREEZE**. Avoid the use of contaminated hoses and equipment that have come into contact with fluids other than ELIMINATOR 1330 antifreeze or water. The use of a pump with a backflow preventer and pressure capabilities to get the system to the supply pressure is recommended. For ELIMINATOR 1330 antifreeze to work correctly, purge as much air as possible from the system. Accelerated corrosion may occur where air pockets exist in the system.
7. **AFTER FILLING THE SYSTEM WITH ELIMINATOR 1330 ANTIFREEZE**, test the system to verify the solution has not been diluted. Take samples of the solution from a high and low point in the system. If the specific gravity or refractive index is not within the allowable range, drain the system and repeat the steps or add ELIMINATOR 1330 antifreeze to displace the non-compliant antifreeze and achieve the required purity. Repeat the required tests to verify the specific gravity or refractive index are within the acceptable range. Repeat this process until the specific gravity or refractive index are within the acceptable range.

SYSTEM TAG

A system tag must be present on an antifreeze system main valve identifying the following:

- Type and manufacturer of the antifreeze solution used
- Volume of antifreeze used
- Percent concentration by volume of antifreeze used

A tag for inspection, testing, and maintenance can also be hung at the system riser to record annual testing data. Contact customer service at Noble and we will supply the tags at no charge.

CARE AND MAINTENANCE

The sprinkler system owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable NFPA standards, in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

NOTICE: *It is recommended that automatic sprinkler antifreeze systems be inspected, tested, and maintained by a qualified inspection, testing, and maintenance service.*

NOTICE: *Mechanical and environmental end use conditions can impact the functional life of the antifreeze solution.*

NOTICE: *Fire sprinkler systems which contain antifreeze shall be inspected, tested, and maintained in accordance with manufacturer's instructions and NFPA 25.*

FLUID TEST

At least once a year, an inspection, testing, and maintenance service shall take a measurement of the specific gravity or refractive index of the fluid in the ELIMINATOR 1330 system. The fluid must be replaced if either property deviates from that originally supplied within the allowed tolerance, as specified in **Table 2**. It is required to have test equipment calibrated per manufacturers schedule to reduce the risk of incorrect test results. Two test methods are acceptable per NFPA 25 to verify that antifreeze is within the specification limits.

USING A HYDROMETER

1. **ENSURE THAT YOUR HYDROMETER** measures specific gravity. The range of specific gravity measurements should cover the acceptable specific gravity range listed in **Table 2** and the hydrometer should have increments of at most 0.002.
2. **ENSURE THE MAIN SUPPLY VALVE IS CLOSED** prior to taking a sample to test. If the valve is open, supply water will be pulled into the system when the first sample is removed from the system. Test separate samples from the top of each system and at the bottom of each system, or otherwise required by applicable NFPA standards. If the most remote portion of the system or the interface with the wet pipe system is not near the top or the bottom of the system, additional samples must be checked.
3. **DISCHARGE A 1 QT (1 L) OF FLUID** from the fluid sampling valve connection. Collect and seal the sample in a clean and dry 1 QT (1 L) or larger container. Allow the sample to warm until it reaches the minimum temperature in **Table 2**.
4. **ONCE THE SOLUTION REACHES THE MINIMUM TEMPERATURE**, fill the 500 ml calibrated cylinder with the solution and gently insert the hydrometer into the cylinder to allow it to float. Fluid may be added to the cylinder until the hydrometer is floating. Note the specific gravity as shown on the hydrometer. Check the temperature using an appropriate thermometer.
5. **VERIFY THE SPECIFIC GRAVITY FALLS WITHIN** the acceptable range listed in **Table 2**. If the test results for all the samples are within the acceptable ranges, the inspection is complete.
6. **IF THE TEST RESULTS FROM ANY OF THE SAMPLES** fall outside of the acceptable ranges, drain out the system, and pump in new ELIMINATOR 1330. Take samples and test again. If the samples continue to fall outside of the acceptable specifications, then the system shall be emptied and vacuumed clean of any remaining fluid. Recharge the system per the Existing System Installation section. If the samples fall within the acceptable range, top off the system to replace the liquid removed for the samples.

NOTICE: *Contaminants or other foreign materials within a sprinkler system may adversely impact the properties and performance of ELIMINATOR 1330. See the Installation section for instructions on flushing and recharging the system if the solution falls outside of the acceptable range since the last inspection.*

NOTICE: *Use of ELIMINATOR 1330 shall be in conformance with all state and local health and environmental regulations for the location where it is installed. If a small amount of antifreeze solution is spilled, absorbent towels are recommended to clean up spill. Towels used to clean up spill can be disposed of in the garbage. Use caution following a spill as the floor may remain slippery in the area of the spill. Consult with a local waste water treatment plant or council for information on procedures to follow for the disposal of large amounts of waste water.*

USING A REFRACTOMETER

For accurate testing of materials like Eliminator 1330, it is essential to use a refractometer equipped with an RI (Refractive Index) scale that spans a range of approximately 1.3 to 1.5.

Important: *Do not use BRIX, GLYCOL, or GLYCERIN scales for this purpose. Always adhere to the manufacturer's instructions, as handheld refractometers may vary slightly by brand.*

BEST PRACTICES FOR ACCURATE MEASUREMENTS WITH A REFRACTOMETER:

- Clean and Dry the Device: Before each use, ensure the refractometer is free of any residue, such as antifreeze or water, as these can skew results.
- Calibrate in the Testing Environment: Calibration should be done with deionized water in the same environment where the refractometer will be used.
- Temperature Matters: Ensure that both the refractometer and the fluid being tested are at similar temperatures to achieve accurate results.
- Proper Sample Application: Use enough drops of the antifreeze to completely cover the sight glass (well). Typically, several drops are needed, and always use a fresh, clean dropper for each test.

The refractive index (RI) is reported as a unitless number and is temperature-dependent, often corrected to 20°C, indicated as “nD20.” The RI changes with temperature; colder fluids will have a higher RI, while warmer fluids will have a lower RI.

SPECIFIC GUIDELINES FOR TESTING ELIMINATOR 1330 WITH A REFRACTOMETER

- Your refractometer must be capable of correcting to 20°C when testing Eliminator 1330.
- Use only the n, nD, or nD20 scales for testing.
- The acceptable refractive index range for Eliminator 1330 is between 1.4018 - 1.4044. Results within this range indicate compliance.

DISPOSAL

Any disposal of ELIMINATOR 1330 shall be in conformance with all federal, state, and local waste regulations. Refer to the ELIMINATOR 1330 Safety Data Sheet at www.noblecompany.com for more details. Dispose of waste and residues in accordance with local authority requirements.
CAS #: 7732-18-5; 56-81-5

TESTING INSTRUMENTS

Hydrometer • Refractometer • Graduated Cylinder • Thermometer

CAUTION:

Hazard(s) not otherwise Classified: Not Classified. GHS PICTOGRAMS: None. GHS HAZARD STATEMENTS: None.

PRECAUTIONARY STATEMENTS:

PREVENTION: Observe good industrial hygiene practices. Isolate from extreme heat & flame.

RESPONSE: Wash hands after handling.

SAFE HANDLING PROCEDURES

FireFighter ELIMINATOR 1330 is formulated to reduce risks to humans and the environment. Wearing gloves and eye protection is best practice when handling ELIMINATOR 1330. For additional product information and Safety Data Sheet, refer to www.noblecompany.com or scan the QR code below.

FIRST AID MEASURES

EYE CONTACT: For eyes, flush with plenty of water for 15 minutes & get medical attention.

SKIN CONTACT: In case of contact with skin, immediately remove contaminated clothing. Wash thoroughly with soap & water. Wash contaminated clothing before reuse.

INHALATION: After high vapor exposure, remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, trained personnel should immediately begin artificial respiration. If the heart has stopped, trained personnel should immediately begin cardiopulmonary resuscitation (CPR).

SWALLOWING: Rinse mouth. GET MEDICAL ATTENTION IMMEDIATELY. Do NOT give liquids to an unconscious or convulsing person.

SUITABLE (& UNSUITABLE) EXTINGUISHING MEDIA: Use dry powder, alcohol-resistant foam, water spray, carbon dioxide.

SPECIAL PROTECTIVE EQUIPMENT & PRECAUTIONS FOR FIRE FIGHTERS: Water spray may be ineffective on fire but can protect firefighters & cool closed containers. Use fog nozzles if water is used. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves, & rubber boots).

SPECIFIC HAZARDS OF CHEMICAL & HAZARDOUS COMBUSTION PRODUCTS:

SLIGHTLY COMBUSTIBLE! Isolate from oxidizers, heat & open flame. Closed containers may explode if exposed to extreme heat. Applying to hot surfaces requires special precautions.



ADDITIONAL PRODUCT
INFORMATION AND
SAFETY DATA SHEET IS
AVAILABLE ON OUR WEBSITE
AT www.noblecompany.com

TABLE 1 - SYSTEM SIZE LIMITATIONS

DESIGNATION	USE TEMP RANGE	APPLICATION	MAX VOLUME OF ANTIFREEZE IN SPRINKLER SYSTEM
Antifreeze	-17°F to 150°F (-27.2°C to 66°C) Freeze Point: -20°F (-28°C)	NFPA 13D [1]	≤500 gal; in accordance with NFPA 13D design criteria
		NFPA 13R – Residential Only (including corridors, garages that serve only a single dwelling unit, and compartmented Ordinary Hazard areas ≤500 sq ft) [1] Where NFPA 13R requires the use of NFPA 13 design criteria, refer to the NFPA 13 applications and volume limitations.	≤500 gal; in accordance with NFPA 13R design criteria Where NFPA 13 design criteria is required in areas of an NFPA 13R Occupancy, such as an attic, common and large garages, or a clubhouse; use the applicable volume limitation for the hazard area for NFPA 13.
		NFPA 13 - Light Hazard [1]	≤40 gal; in accordance with NFPA 13 design criteria
		NFPA 13 – Ordinary Hazard Groups 1 & 2 [1]	≤40 gal; in accordance with NFPA 13 design criteria
		NFPA 13 – Storage [1]	≤40 gal; in accordance with NFPA 13 design criteria

TABLE 2 - ACCEPTABLE PHYSICAL PROPERTY RANGES FOR FIREFIGHTER ELIMINATOR 1330

ELIMINATOR 1330 CONCENTRATION	SPECIFIC GRAVITY AT 77°F (25°C)	pH AT 68°F (20°C)
100%	1.142 - 1.158	7.8 - 10.0
	VISCOSITY AT 77°F (25°C)	VISCOSITY AT -20°F (-29°C)
	5.8 CPS	173.1 CPS
	REFRACTIVE INDEX RANGE AT 68°F (20°C)	
	1.4018 - 1.4044	

TABLE 3 - DENSITY AT TEMPERATURE LIMITATIONS

ELIMINATOR 1330 CONCENTRATION	DENSITY AT 150°F (65.6°C)	DENSITY AT -17°F (-27.2°C)
100%	68.6 #/ft³ (1.099 gr/ml)	73.4 #/ft³ (1.1751 gr/ml)

TABLE 4 - TYPICAL PROPERTIES

APPEARANCE	FREEZE POINT	DENSITY AT 77°F (25°C)	pH	CONDUCTIVITY	SPECIFIC GRAVITY	VISCOSITY
Liquid, Orange	-20°F (-28°C)	69.75 #/ft³ (1.118 gr/ml)	7.8 - 10.0 at 68°F (20°C)	5959-6999 µS with a target of 6000 µS	1.142 - 1.158 at 77°F (25°C)	5.8 cps at 77°F (25°C) 173.1 cps at -20°F (-29°C)

[1] The antifreeze solution is intended to be installed in accordance with the manufacturer’s instructions. For all systems, the following requirements shall apply: (a) the use of the antifreeze solution is limited to the aboveground system piping only except for a limited length of underground piping that connects sections of the aboveground system, (b) the viscosity of the antifreeze solution at the lowest anticipated temperature of the system shall be considered in the hydraulic design, (c) the friction loss shall be determined using the Hazen-Williams formula for water and the Darcy-Weisbach formula to account for the antifreeze solution fluid properties, and (d) the K-factor of the sprinkler shall be adjusted to account for the density of the antifreeze.



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