

	<h1 style="margin: 0;">TECHNICAL DATA</h1>	<p><b>FIREFIGHTER ELIMINATOR C</b> 35% PROPYLENE GLYCOL/WATER SOLUTION</p>
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**The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058**

**Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com**

**1. DESCRIPTION**

Viking Firefighter Eliminator C is a certified premixed 35% propylene glycol/water antifreeze solution required for use with the Viking ESFR Cold Storage System. The system provides fixed fire protection for refrigerated or cold warehouse storage and is also appropriate for unheated storage applications in areas subject to freezing, to a minimum temperature of 8 °F (-13.3 °C). The piping system is filled with pressurized propylene glycol and water solution maintained from a pressure pump system that controls and maintains the desired solution pressure. This is a pre-primed preaction system with electric release that utilizes a deluge valve with conventional and electric release trims. The riser consists of two Easy Riser Check Valves, one with special cold trim and the second with by-pass trim to isolate the antifreeze in the system from the water supply. The additional Easy Riser Check is installed above the main Check valve and is required to prevent thermal transfer of cold antifreeze from freezer area onto the clapper surface of the primary Check valve and minimize frost on riser assembly.

This system must be limited in volume to 1,100 gallons (4 163 liters) total from the Easy Riser Check valve in order to expel the propylene glycol water mixture and flow 100% water from the sprinklers as rapidly as possible to control or suppress the fire.

The propylene glycol and water mixture cools and adds wetting ability to control the fire until the water is applied to suppress the fire. The area of coverage for a single system is dependent on the volume of the system required to cover the area being protected. The hydraulic calculations are necessary in order to properly size the system piping (refer to data page 45 a-j for hydraulic calculation requirements).

**NOTE: THE VIKING ESFR COLD STORAGE SYSTEM SHALL BE DESIGNED BY QUALIFIED FIRE PROTECTION TECHNICIANS, IN CONJUNCTION WITH REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION. THESE SYSTEMS ARE DESIGNED TO MEET THE UL LISTING REQUIREMENTS DESCRIBED IN VIKING TECHNICAL DATA FOR ESFR K25.2 SPRINKLER VK510 WHEN USED WITH PROPYLENE GLYCOL/WATER SOLUTION, THE STANDARDS OF NFPA 13, AND ALSO WITH THE PROVISIONS OF GOVERNMENTAL CODES, ORDINANCES, AND STANDARDS WHERE APPLICABLE.**

**2. LISTINGS AND APPROVALS**

There are no listings or approvals for Firefighter Eliminator C.

**3. TECHNICAL DATA**

**Typical Properties (Not for specification purposes)**

- Concentration - 35% by volume propylene glycol
  - < 5% dipotassium phosphate (corrosion inhibitor)
  - < 3% coloring
  - remainder - deionized water

Minimum use temperature: 8 °F (-13.3 °C)  
 Freeze point: 2.4°F (-16.4 °C)  
 pH: 9

Appearance: Fluorescent green color

For further details, see the Viking Firefighter Eliminator C Material Safety Data Sheet (page 50 e-h).

Environmental & Toxicological Information - Viking Firefighter Eliminator C is virtually harmless to animals or plants; however, as with any substance, care should be taken to prevent discharge from entering ground water, surface water, or storm drains. Disposal of this solution should be made in accordance with federal, state, and local regulations.

Propylene glycol/water solutions are designed to be installed on systems supplied by potable water supplies. Local authorities should be consulted prior to draining system to storm sewers or to natural drainage areas.

**Ordering Information**

Viking Part Numbers:  
 12968-55 = 55 gallon drum  
 12968-275 = 275 gallon drum  
 12968-BULK = tanker delivery  
 Manufactured by - The Noble Company, 7300 Enterprise Dr., Spring Lake, MI U.S.A. 49456

Viking Technical Data may be found on The Viking Corporation's Web site at <http://www.vikingcorp.com>. The Web site may include a more recent edition of this Technical Data Page.

**4. INSTALLATION**

N/A

**5. OPERATION**

N/A

<b>Table 1 - Solution Properties for Given Temperatures</b>			
<b>Temp.</b>	<b>Specific Gravity</b>	<b>Density (lbs/ft<sup>3</sup>)</b>	<b>Viscosity (cps)</b>
<b>6°F (-14.5°C)</b>	1.040	64.90	18
<b>68°F (20°C)</b>	1.033	64.46	4

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### Figure 1 - Equations

<p><b>Darcy Weisbach Procedure</b></p> <ol style="list-style-type: none"> <li>1. Calculate Reynolds Number</li> <li>2. Calculate relative roughness of pipe</li> <li>3. Use Moody Diagram to find "f"</li> <li>4. Calculate friction loss</li> </ol>	<p><b>Reynolds Number</b></p> <p>Re=50.6Qp/dμ</p> <p>Q=flow (gpm)</p> <p>ρ=density (lbs/ft<sup>3</sup>)</p> <p>d=internal pipe diameter (in)</p> <p>D= internal pipe diameter (ft)</p> <p>L=pipe length (ft)</p> <p>μ=dynamic viscosity (cps)</p>
<p><b>Pipe Roughness C=120 steel pipe - ε = .00033</b></p> <p><b>Relative pipe roughness = ε/D</b> (Use Moody Diagram - NFPA 13, 2007 Fig. A.22.4.4.5.1)</p>	
<p>If Re &gt; 2000, f = Moody Diagram NFPA 750 fig 6-2.2 or fire pump handbook pg 16</p> <p>If Re &lt; 2000, f = 64/Re</p>	
<p><b>Friction Loss = ΔP (psi)</b></p> <p>Re &gt; 2000 = 0.000216 fLρQ<sup>2</sup>/d<sup>5</sup> (transition to turbulent)</p> <p>Re &lt; 2000 = 0.000273 μLQ/d<sup>4</sup> (laminar flow)</p>	

Table 2 - Firefighter Eliminator C Propylene Glycol Refractive Index		
Freezing Point	Volume % Propylene Glycol	Refractive Index 71.6 °F (22 °C)
2.5 °F (-16.4 °C)	34.4%	1.3733
.9 °F (-17.3 °C)	35.5%	1.3744
-.8 °F (-18.2 °C)	36.5%	1.3756

## 6. INSPECTIONS, TESTS AND MAINTENANCE

Field mixing of propylene glycol and site water is strictly prohibited, as the control of the mixture cannot be assured. Improper field mixing of solution can result in reduced capability to prevent freezing or to control a fire. Firefighter Eliminator C is already premixed and ready to use.

### Testing the Solution

Antifreeze solution shall be checked quarterly (for gridded systems), or semi-annually (for tree type configurations) with a refractometer to detect the concentration of antifreeze solution and effectiveness against freezing. Sampling shall be taken from multiple points within the freezer system (refer to the instructions on data pages 45 h for fluid sampling). When draining sample antifreeze solution from the system, be sure to shut off the system control valve directly upstream of the Easy Riser Check valve so that water doesn't enter the system. After the CS-1 pump has restored the antifreeze solution pressure, ensure that the water supply control valve is returned to the fully open position once fluid sampling is completed. Multiple propylene glycol/water solution test valves are to be installed in several areas on the system piping for testing with a refractometer (refer to data page 45 a-j for testing requirements and procedures).

If the propylene glycol/water solution becomes diluted or does not pass the refractometer test, the entire system is to be drained. All sections of trapped piping are to be drained. Five percent (5%) of the pendent ESFR sprinklers in all locations throughout the system are to be removed and inspected for frozen solution. If any of the pendent ESFR sprinklers are found with frozen solution, all the pendent ESFR sprinklers are to be removed and replaced with new Viking K25.2 Pendent ESFR VK510 Sprinklers prior to re-charging system with new 35% premix propylene glycol/water solution. If the 5% of removed sprinklers are not damaged, they can be re-installed in the system.

## 7. AVAILABILITY

Firefighter Eliminator C is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

## 8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

<b>Table 3 - Propylene Glycol Compatibility Chart</b>	<b>Thermoplastics</b>	PVC	C	A = Excellent resistance B = Fair C = Poor  Information provided by The Noble Company
		CPVC	C	
		Polyethylene (PE)	B	
		Polyethylene Cross Linked (XLPE)	A	
		Teflon	A	
	<b>Gaskets</b>	ABS	B	
		Viton	A	
		EPDM	A	
		Neoprene	C	
		Buna N (Nitrile)	A	
	Hypalon	A		