HFC-227EA CLEAN AGENT

DESCRIPTION

HFC-227ea provides superior fire protection in a wide range of applications from sensitive electrical equipment to industrial applications using flammable liquids. HFC-227ea is ideal for applications where clean-up of other media presents a problem, where weight versus suppression potential is a factor, where an electrically non-conductive medium is needed and where people compatibility is an overriding factor. When environmental impact is a consideration, HFC-227ea is particularly useful. It has zero ozone-depleting potential, low global warming potential and a short atmospheric lifetime. These characteristics make it suitable not only for new installations using Fike's total flooding systems, but also for Halon 1301 replacement applications.

HFC-227ea is an odorless, colorless, liquefied compressed gas. (See Physical Properties Table for additional information). It is stored as a liquid and dispensed into the hazard as a colorless, electrically non-conductive vapor that is clear and does not obscure vision. It leaves no residue and has acceptable toxicity for use in occupied spaces at design concentration. HFC-227ea extinguishes a fire by a combination of chemical and physical mechanisms. HFC-227ea does not displace oxygen and therefore is safe for use in occupied spaces without fear of oxygen deprivation.

FEATURES AND BENEFITS

- Colorless, odorless, liquefied compressed gas
- Stored as a liquid
- Electrically non-conductive
- Discharges as a gaseous vapor (due to its relatively low boiling point)
- Zero ozone depleting potential
- Low global warming potential
- Included on the U.S. EPA Significant New Alternative Policy (SNAP) rules

EXTINGUISHING METHOD - HFC-227ea

HFC-227ea extinguishes a fire primarily through Heat Absorption that occurs as the agent changes from a liquid to a vapor during discharge. In addition, HFC-227ea also disrupts the combustion reaction which aids in the extinguishment of a fire. It is important to note, HFC-227ea does not use the depletion of oxygen to extinguish a fire.

USE AND LIMITATIONS - HFC-227ea

HFC-227ea system shall be used on the following Class of Hazards:

Class A & C:  Electrical and Electronic Hazards, Telecommunications Facilities, High value assets, where the associated down-time would be costly

Class B:  Flammable liquids and gases

HFC-227ea systems shall “NOT” be used on fires involving the following materials:

- Chemicals or mixtures of chemicals that are capable of rapid oxidation in the absence of air. (Examples include: Cellulose Nitrate and Gunpowder)
- Reactive metals such as Lithium, Sodium, Potassium, Magnesium, Titanium, Zirconium, Uranium, and Plutonium
- Metal hydrides such as Sodium Hydride and Lithium Aluminum Hydride
- Chemicals capable of undergoing auto-thermal decomposition. (Examples: Organic Peroxides and Hydrazine)
EXPOSURE LIMITATIONS

<table>
<thead>
<tr>
<th>Hazard Type</th>
<th>Design Concentration</th>
<th>Maximum Human Expose Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normally Occupied Space</td>
<td>6.25% to 10.5%</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Normally Un-Occupied Space</td>
<td>11.0% to 12.0%</td>
<td>30 seconds</td>
</tr>
</tbody>
</table>

Note: Fike does not recommend HFC-227ea systems to be used in any normally occupied spaces where the design concentration required is above 10.5%

Warning: The discharge of clean agent systems to extinguish a fire can result in potential hazard to personnel from the natural form of the clean agent or from the products of combustion that result from exposure of the agent to the fire or hot surfaces. Unnecessary exposure of personnel either to the natural agent or to the products of decomposition shall be avoided.

PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Chemical Name/Formula</th>
<th>Heptafluoropropane / CF₃CHFCF₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASHRAE Designation</td>
<td>HFC-227ea</td>
</tr>
<tr>
<td>CAS Number</td>
<td>431-89-0</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>170.03</td>
</tr>
<tr>
<td>Vapor Density @ 25°C (77°F) and atm, kg/m³ (lb/ft³)</td>
<td>7.148 (0.4462)</td>
</tr>
<tr>
<td>Boiling Point, °C (°F)</td>
<td>-16.4 (2.5)</td>
</tr>
<tr>
<td>Melting Point, °C (°F)</td>
<td>-131 (204)</td>
</tr>
<tr>
<td>Critical Temperature, °C (°F)</td>
<td>101.6 (214.9)</td>
</tr>
<tr>
<td>Critical Pressure, kPa (psia)</td>
<td>2930 (424.7)</td>
</tr>
<tr>
<td>Critical Density, kg/m³ (lb/ft³)</td>
<td>621 (38.77)</td>
</tr>
<tr>
<td>Liquid Density @ 25°C (77°F), kg/m³ (lb/ft³)</td>
<td>1386 (86.53)</td>
</tr>
<tr>
<td>Vapor Density @ 25°C (77°F) and 1 atm, kg/m³ (lb/ft³)</td>
<td>7.148 (0.4462)</td>
</tr>
<tr>
<td>Specific Heat, Liquid (Cp) @ 25°C (77°F), kJ/Kg- °C (Btu/lb°F)</td>
<td>1.247 (0.2979)</td>
</tr>
<tr>
<td>Specific Heat, Vapor (Cp) @ 25°C (77°F) kJ/Kg- °C (Btu/lb°F) and 1 ATM</td>
<td>0.8136 (0.1945)</td>
</tr>
<tr>
<td>Vapor Pressure, Saturated @ 25°C (77°F), kPa (psia)</td>
<td>453.3 (65.7)</td>
</tr>
<tr>
<td>Heat of Vaporization @ Boiling Point kJ/Kg (Btu/lb)</td>
<td>132.6 (56.7)</td>
</tr>
<tr>
<td>Thermal Conductivity, Liquid @ 25°C (77°F), W/m- °C (Btu/hr-ft°F)</td>
<td>0.0533 (0.0308)</td>
</tr>
<tr>
<td>Thermal Conductivity, Vapor @ 25°C (77°F), W/m- °C (Btu/hr-ft°F)</td>
<td>0.0127 (0.0073)</td>
</tr>
<tr>
<td>Viscosity, Liquid @ 25°C (77°F), cP (lb/ft-hr)</td>
<td>0.2442 (0.5907)</td>
</tr>
<tr>
<td>Relative Dielectric Strength @ 1 atm, 25°C (N2=1)</td>
<td>2.00</td>
</tr>
<tr>
<td>Solubility of Water in HFC-227ea @ 20°C (68°F), ppm</td>
<td>600</td>
</tr>
<tr>
<td>Ozone Depletion Potential</td>
<td>0.0</td>
</tr>
<tr>
<td>Global Warming Potential (based on a 100-yr ITH for CO2, GWP = 1)</td>
<td>2900</td>
</tr>
</tbody>
</table>
AGENT STORAGE CONTAINERS WITH HFC-227EA

DESCRIPTION
Fike Clean Agent Containers are used in fire extinguishing systems to store the Clean Agent until a fire develops and the agent must be released. The Clean Agent is retained in the container by a Impulse Valve assembly which contains a fast-acting rupture disc. The disc will be ruptured, and the Clean Agent released, through the operation of an actuator by an electric signal that is automatically, manually or pneumatically controlled.

Fike Clean Agent Containers have passed extensive testing by Factory Mutual and Underwriters Laboratory and are used in installations where 3 to 1045 pounds (2.0 to 474 kg) of HFC-227ea agent is required. Clean Agent containers can be filled in 1 pound (0.5 kg) increments to their maximum capacity.

SPECIFICATIONS
Fill Range: 40 to 70 lbs/ft³ (630 to 1121 kg/m³)
Fill Increments: 1.0 lbs (0.5 kg)
Container Super - Pressurization Level: 360 psig at 70°F (24.8 bar at 21°C)
Container Storage Temperature Limitation: 32°F (0°C) - minimum, 130°F (54.4°C) - maximum

Note: If container temperatures exceeding 130°F (54.4°C), valve will open automatically, this also fulfills the pressure relief valve requirements in accordance with DOT regulations.

Container Construction: Carbon Steel Alloys
Paint Options: Baked enamel finish white (default) or red
Container Ratings: DOT 4BW500
TC 4BWMS4
Actuation Methods: Electric/Pneumatic/Manual

APPROVALS:
- UL Listed
- ULC Listed
- FM Approved
## CONTAINER DATA/SPECIFICATIONS

<table>
<thead>
<tr>
<th>Container</th>
<th>Fill range</th>
<th>Valve Size</th>
<th>Tare Weight</th>
<th>Dimensions (approximate)</th>
<th>Mounting Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Diameter</td>
<td>Height</td>
</tr>
<tr>
<td></td>
<td>Lb. (L)</td>
<td>P/N</td>
<td>Minimum</td>
<td>Maximum</td>
<td>IN (mm)</td>
</tr>
<tr>
<td>5 (2)</td>
<td>70-272</td>
<td>3</td>
<td>5</td>
<td>11</td>
<td>4.2 (102)</td>
</tr>
<tr>
<td>10 (4)</td>
<td>70-273</td>
<td>6</td>
<td>10</td>
<td>15</td>
<td>4.2 (102)</td>
</tr>
<tr>
<td>20 (8.5)</td>
<td>70-263</td>
<td>12</td>
<td>21</td>
<td>22</td>
<td>7.0 (178)</td>
</tr>
<tr>
<td>35 (15)</td>
<td>70-264</td>
<td>22</td>
<td>38</td>
<td>32.5</td>
<td>7.0 (178)</td>
</tr>
<tr>
<td>60 (27)</td>
<td>70-265</td>
<td>39</td>
<td>68</td>
<td>52.5</td>
<td>10.75 (273)</td>
</tr>
<tr>
<td>100 (44)</td>
<td>70-266</td>
<td>63</td>
<td>108</td>
<td>77</td>
<td>10.75 (273)</td>
</tr>
<tr>
<td>150/150i</td>
<td>70-267</td>
<td>87</td>
<td>150</td>
<td>118/114</td>
<td>20.0 (508)</td>
</tr>
<tr>
<td>215 (88)</td>
<td>70-268</td>
<td>124</td>
<td>216</td>
<td>146</td>
<td>20.0 (508)</td>
</tr>
<tr>
<td>375 (153)</td>
<td>70-269</td>
<td>217</td>
<td>378</td>
<td>213</td>
<td>20.0 (508)</td>
</tr>
<tr>
<td>650 (267)</td>
<td>70-270</td>
<td>378</td>
<td>660</td>
<td>373</td>
<td>24.0 (610)</td>
</tr>
<tr>
<td>1000 (423)</td>
<td>70-271</td>
<td>598</td>
<td>1045</td>
<td>535</td>
<td>24.0 (610)</td>
</tr>
</tbody>
</table>
ITEMS SUPPLIED WITH CONTAINER ASSEMBLY

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
<th>Data Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Victaulic Coupling &amp; Nipple</td>
<td>IV.1.19.01</td>
</tr>
<tr>
<td>2</td>
<td>Impulse Valve</td>
<td>IV.1.14.01</td>
</tr>
<tr>
<td>3</td>
<td>Pressure Gauge</td>
<td>IV.1.13.01</td>
</tr>
<tr>
<td>4</td>
<td>Liquid Level Indicator (LLi)</td>
<td>C.1.40.01</td>
</tr>
<tr>
<td>5</td>
<td>LLi Boss (see note 1)</td>
<td>n/a</td>
</tr>
<tr>
<td>6</td>
<td>Nameplate (see note 2)</td>
<td>n/a</td>
</tr>
<tr>
<td>7</td>
<td>Siphone Tube (see note 3)</td>
<td>n/a</td>
</tr>
<tr>
<td>8</td>
<td>Mounting Straps &amp; Brackets</td>
<td>IV.1.18.01</td>
</tr>
</tbody>
</table>

Notes:
1) 100 thru 1000 lb. (44 thru 423 L) containers are equipped with a LLi Boss.

2) Fike nameplate provides the information that is specific to each container: Assembly and serial number of the container, weight information: tare, gross and agent and installation, operation and safety information. All containers filled either by the factory or by an Approved Initial Fill Station are provided with a name plate bearing the UL & FM markings.

3) Fike Clean Agent containers [except the 150i (Inverted)] are equipped with a siphon tube. The 20, 35 & 60 lb. containers have bent siphon tubes and the 5, 10 and 100 – 1000 lb. containers have straight siphon tubes. All containers with siphon tubes can be mounted upright. The 20, 35 & 60 lb containers can also be mounted horizontally. The 150 container can only be mounted upright and the 150i can only be mounted inverted.
OPTIONAL ITEMS FOR CONTAINER
The following container accessory items must be ordered separately.

ACTUATION COMPONENTS

- Electric / Manual Actuation – Impulse Valve Operator (IVO) (For detailed information, refer to the IVO Data Sheet IV.1.09.01)

ACTUATION METHODS

Clean Agent containers with an Impulse Valve can be actuated by the following methods:

- Method 1 – Electric Actuation – Single Container System w/ IVO & IRM
- Method 2 – Electric Actuation – Multi-Containers System w / IVO & IRM
- Method 3 – Electric & Pneumatic Actuation – Two Container System w/ IVO & IVPO
- Method 4 – Electric & Pneumatic Actuation – Multi Container System w/ IVO & IVPO

For detailed information on actuation methods, refer to the Impulse Valve Operator (IVO) data sheet IV.1.09.01.

These devices provide the force required to extend a pin that will open the rupture disc, allowing the agent to be released from the container.
LOW PRESSURE SWITCH
The Low Pressure Switch provides a means to continuously monitoring the container pressure for a low-pressure condition.

If the pressure inside the container drops below 288 psig (1986 kPa), the switch contacts will transfer and invoke a “trouble” indication on the control panel.

The Low Pressure Switch (P/N 02-12533) has a single pole, double-throw switch that can be wired for normally open or normally closed.

For detailed information, refer to the Low Pressure Switch Data Sheet IV.1.13.01.

INSTALLATION
The system installation must comply with the requirements of this manual; NFPA 2001, latest edition; all applicable local codes, regulations, and standards and the authority having jurisdiction (AHJ).

Warning: DO NOT start system installation until the final design of the total system has been verified using Fike’s Engineered Flow Calculation.

Warning: The Actuator shall always be the last component installed on a Fike Clean Agent Fire Suppression system to avoid accidental discharge.

Factors to Consider - Container Location
Mounting Surface: Container brackets must be mounted securely to solid load-bearing surfaces that will support the container load. Some installations may require additional mounting support not supplied by Fike.

Environmental Effects: Container(s) should be located in clean, dry, and relatively vibration-free areas. Avoid aisle ways and other high traffic areas where physical damage or tampering is more likely. Container(s) should never be mounted where the container could potentially be splashed with, or submerged in any liquid. Do not locate containers where they would be subject to physical damage, exposure to corrosive chemicals, or harsh weather conditions.

Temperature Range: Container locations must be between 32 to 130°F (0 to 54.4°C). Temperatures outside of this range may result in the system not supplying the desired quantity of agent or accidental discharge.

Serviceability: In general, the larger the container, the more difficult it will be to remove it from the system for maintenance and service. However, smaller containers that are located in a sub-floor space, under a computer bank, or above the ceiling over the same computer bank can be difficult as well.

Floor Space: Consideration should be given to the space available to install the container(s). For example, a 900 lb. (408 kg) system could be stored in (2) 650 lb. (267 L) containers located on the floor. However, if floor space is a problem, the system could be designed to utilize (6) 150i lb. (61 L) Inverted Containers mounted on the wall(s).

Floor Loading: Floor loading must be considered when selecting a container location. The floor must be able to support the total weight of the Fike container(s) as they are moved into position. Consult raised floor manufacturer for floor loading limitation. The following guidelines are recommended:

• Raised floor loading is a function of the manufacturer’s load specification and the positioning of the container(s) on the raised floor grid.

Note: Fike cannot assume responsibility for determining the suitability of a particular raised floor system; the following does provide information to help determine installation requirements.

• When clean agent containers are located on a raised floor, floor integrity must be considered to determine if the type of tile and vertical floor support can handle the increased load. If necessary additional floor supports can be added.

Option: To help distribute the container weight over a greater area, a ¼” steel plate can be placed under the container(s), sized to span multiple floor supports. If container spans multiple floor tiles, add additional floor supports (Minimum of 4 floor supports, 1 per corner, must be used). Excessive floor loading may require relocating the container(s) to a more suitable location. For floor loading information refer to the table on page 6 or to Fike’s ECARO-25 Flow Calculation program for container size and actual fill weight being supplied.
<table>
<thead>
<tr>
<th>Container Size</th>
<th>Total Container Weight</th>
<th>Container Floor Area</th>
<th>Container Floor Loading</th>
<th>Container Floor Area w/ Plate</th>
<th>Container w/ Plate Floor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb. (L)</td>
<td>lbs. (kg)</td>
<td>ft² (m²)</td>
<td>lbs/ft² (kg/m²)</td>
<td>1/4: x 2’ x 2’ plate (6.4mm x 0.6m x 0.6m) plate</td>
<td>lbs/ft² (kg/m²) see note 2</td>
</tr>
<tr>
<td>1000 (423)</td>
<td>1386 (628)</td>
<td>3.14 (0.29)</td>
<td>508 (2493)</td>
<td>4.0 (0.36)</td>
<td>404 (2037)</td>
</tr>
<tr>
<td>650 (267)</td>
<td>913 (41)</td>
<td>3.14 (0.29)</td>
<td>333 (1636)</td>
<td>4.0 (0.36)</td>
<td>267 (1467)</td>
</tr>
<tr>
<td>375 (153)</td>
<td>527 (239)</td>
<td>2.18 (0.20)</td>
<td>277 (1368)</td>
<td>4.0 (0.36)</td>
<td>156 (788)</td>
</tr>
<tr>
<td>215 (88)</td>
<td>328 (148)</td>
<td>2.18 (0.20)</td>
<td>170 (840)</td>
<td>4.0 (0.36)</td>
<td>98 (495)</td>
</tr>
<tr>
<td>150 (61)</td>
<td>283 (128)</td>
<td>2.18 (0.20)</td>
<td>138 (680)</td>
<td>4.0 (0.36)</td>
<td>81 (406)</td>
</tr>
<tr>
<td>100 (44)</td>
<td>164 (74)</td>
<td>0.63 (0.06)</td>
<td>294 (1400)</td>
<td>4.0 (0.36)</td>
<td>52 (262)</td>
</tr>
<tr>
<td>60 (27)</td>
<td>106 (48)</td>
<td>0.63 (0.06)</td>
<td>190 (908)</td>
<td>4.0 (0.36)</td>
<td>36 (180)</td>
</tr>
<tr>
<td>35 (15)</td>
<td>51 (23)</td>
<td>0.27 (0.03)</td>
<td>256 (115)</td>
<td>4.0 (0.36)</td>
<td>23 (114)</td>
</tr>
<tr>
<td>20 (8.5)</td>
<td>37 (17)</td>
<td>0.27 (0.03)</td>
<td>156 (72)</td>
<td>4.0 (0.36)</td>
<td>16 (83)</td>
</tr>
<tr>
<td>10 (4)</td>
<td>23 (11)</td>
<td>0.10 (0.009)</td>
<td>250 (1278)</td>
<td>4.0 (0.36)</td>
<td>12 (60)</td>
</tr>
<tr>
<td>5 (2)</td>
<td>15 (7)</td>
<td>0.10 (0.009)</td>
<td>160 (833)</td>
<td>4.0 (0.36)</td>
<td>10 (49)</td>
</tr>
</tbody>
</table>

Notes:
1) Total container weight is based on container tare weight + maximum fill weight
2) Total container weight + 22.5 lbs (10.2 kg) added for 1/4” x 2’ x 2’ (6.4mm x 0.6m x 0.6m) plate used to calculate container with plate floor loading
RECHARGE ITEMS – 1 IN (25\text{mm}) & 3 IN (80\text{mm}) VALVE (Must Order Separate)

After a system has been discharged, the following items must be replaced before a container can be recharged. For a detailed procedure on recharging a Fike container w/ an Impulse Valve refer to Fike’s Recharge Manual (p/n 06-290).

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>1 IN (25\text{mm}) Recharge Kit (P/N 85-047) includes the following:</th>
<th>3 IN (80\text{mm}) Recharge Kit (P/N 85-048) includes the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Part Number</td>
<td>Part Number</td>
</tr>
<tr>
<td>1</td>
<td>Friction Ring</td>
<td>70-2060</td>
<td>70-2063</td>
</tr>
<tr>
<td>2</td>
<td>Disc Assembly</td>
<td>70-247</td>
<td>70-248</td>
</tr>
<tr>
<td>3</td>
<td>O-Ring</td>
<td>02-11987</td>
<td>02-11989</td>
</tr>
<tr>
<td>4</td>
<td>Valve Core-Fill Port (not shown)</td>
<td>02-4161</td>
<td>02-4161</td>
</tr>
<tr>
<td>5</td>
<td>Reconditioning Instructions (not shown)</td>
<td>06-567</td>
<td>06-567</td>
</tr>
</tbody>
</table>

Note: 1 IN Recharge Kit is used on 5, 10, 20, 35, 60 & 100 lb. (2, 4, 8, 15, 27 & 44 \text{L}) containers.
3 IN Recharge Kit is used on 150, 150i, 215, 375, 650 & 1000 lb. (61, 61i, 88, 153, 267 & 423 \text{L}) containers.
APPLICATION PROFILE

FLAMMABLE LIQUIDS STORAGE FACILITIES

INDUSTRIES SERVED
• Automobile Manufacturing
• Industrial Plants
• Process Plants
• Refineries/Chemical Plants
• Marine/Off-shore

INTRODUCTION
Flammable liquid storage facilities are in many industrial and chemical plants as well as production facilities that use flammable liquids in various processes. These facilities store the flammable liquids used in processes such as painting, lubrication, fuel, and oil in areas called “Flammable Liquid Storage Areas”. These areas are segregated due to the special and careful handling required when using the flammable liquid.

THE PROBLEM: RAPID FIRE GROWTH
Because of their critical nature, the potential fire problem in a flammable liquid storage facility gets special attention. Sprinkler systems provide good back-up protection, but if a fire should occur, it must be quickly suppressed before there is a major interruption in production or severe damage to the facility. The quantity of flammable liquid alone can contribute to fires that can destroy an entire facility. Flammable liquid fires grow very rapidly because they burn the vapors of the fuel on fire creating a tremendous amount of heat. This promotes involvement of other flammable liquids stored in the hazard, which can happen instantaneously.

THE SOLUTION: DUPONT™ FM-200®
If the desire for the facility is to minimize clean-up, ensure a safe fire suppressant agent for employees, and suppress the fire quickly, then a Fike FM-200 system provides all the necessary components of the fire suppression system. Because FM-200 discharges as a gas, it extinguishes a fire without spreading the liquid. It also does not require provision for drainage and containment of liquids. If the flammable liquid storage room is occupied, you do not have to worry that a system discharge could result in a fatality. At normal design concentrations, FM-200 is safe to use in occupied spaces. In a flammable liquid fire it is important to detect and suppress the fire quickly which makes FM-200, along with the 10 second discharge time, a good choice for protection of flammable liquids.

In a fire suppression system, FM-200 is stored as a liquid in FM-200 storage containers. When called upon by an approved control panel, the FM-200 will flow through the length of piping required and will immediately change from a liquid to a vapor as it is released through the discharge nozzle.

To provide proper fire protection for a flammable liquid storage facility, it is imperative that a well-designed, fast response, and trouble free automatic fire detection system be installed. In many cases vapor or flame detection will be used. Advise should be sought when designing the detection system due to the amount of detectors available and the conditions in which they operate.

The example on the next page walks through a flammable liquid storage facility designed with a Fike FM-200 system.

EXAMPLE SYSTEM
This example walks through the design for a fire detection and suppression system in a Flammable liquid storage facility. This room contains barrels of diesel fuel, gasoline, and has storage cabinets with various fuels and amounts of flammable liquid. The room being protected is 20’ X 20’ in dimension with a 10 foot ceiling. The first step is to determine the quantity of FM-200 required to protect the hazard. The quantity of FM-200 required is dependent on the fuels being protected. In order to determine the FM-200 concentration required, an evaluation of the flammable liquids present must be performed. Once all of the fuels have been identified, the required FM-200 concentration is determined by choosing the fuel with the highest design concentration required. The design concentration for each fuel is determined by performing a cup burner test as described in NFPA 2001, Appendix B. A 30% safety factor is then added to the cup burner concentration, which is the design concentration for that fuel. Contact Fike for design concentrations of particular flammable liquids. For this example, gasoline requires the highest concentration of FM-200 at 7.5% design concentration at the minimum expected room temperature of 50°F.

Using the formula: \[ W = \frac{V}{S} \left(\frac{C}{100-C}\right) \]
Where:
- \( W \) = weight of FM-200
- \( V \) = volume of the hazard protected (4000 ft³ for this example)
- \( S \) = Specific vapor volume of HFC-227ea = 1.885 + .0045(T) where T = temp in °F
- \( S = 2.11 \text{ ft}^3/\text{lb} \) when \( T = 50°F \)
- \( C \) = FM-200 concentration (7.5%)

Solving for \( W \), this hazard requires 154 pounds of FM-200.
This hazard will be protected using a pre-engineered FM-200 system approach with two 180° nozzles. I have used the pre-engineered approach because I am protecting a single hazard with a single cylinder and I wanted to save engineering time doing the system design. There are benefits of designing the system engineered over pre-engineered and they are described in the FM-200 Design Guide.

The next step in designing the system is to layout the system nozzles in the protected space. As mentioned before the room requires 154 pounds of FM-200 to protect the hazard. I have decided to use two 180 degree nozzles mounted on the same wall to protect this space. I have used 180 degree nozzles to minimize the amount of piping required and to keep the piping away from air-handling units and other equipment in the center of the room. A diagram of the container and piping isometric is shown for your reference.

The next step is to lay out the detection and control system for this facility. As mentioned before, Flame detectors will be used for detection in this facility. The reason for choosing Flame detectors is that they are good at picking up small, flaming fires that develop rapidly. I am not going to discuss detector spacing of the Flame detectors due to the wide range of products available and protection objectives of the system. Fike always recommends that UL Listed and/or FM Approved detectors be used. Consult the detector manufacturer and Fike for detector spacing limitations.

The Fike SHP PRO conventional control system will be used to provide reliable detection. A layout of the control panel with accessories is shown on the hazard layout. An equipment list for this hazard is shown for your reference on the next page.

---

**EQUIPMENT LIST**

Below is an equipment list for the FM-200 system installed in the flammable liquid storage room on the diagram above.

<table>
<thead>
<tr>
<th>Fike P/N</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FM-200 Suppression Equipment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-087-154-1431-04</td>
<td>215 pound FM-200 Container Assembly w/ 154 pounds FM-200 LLI, and Pressure Switch</td>
<td>1</td>
</tr>
<tr>
<td>80-1115</td>
<td>1-1/2&quot;-180 Degree Pre-Engineered Nozzle</td>
<td>2</td>
</tr>
<tr>
<td><strong>SHP PRO Equipment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-051-R-1</td>
<td>SHP Control System</td>
<td>1</td>
</tr>
<tr>
<td>10-1643</td>
<td>Manual Release/System Abort Switch</td>
<td>1</td>
</tr>
<tr>
<td>20-098</td>
<td>Horn/Strobe</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Listed and/or Approved U.V. Flame Detectors</td>
<td></td>
</tr>
</tbody>
</table>
This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product name</th>
<th>FM-200®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradename/Synonym</td>
<td>FE-227</td>
</tr>
<tr>
<td></td>
<td>2-Hydroperfluoropropane</td>
</tr>
<tr>
<td></td>
<td>Propane, 1,1,1,2,3,3,3-Heptafluoro-HFC-227eaHP</td>
</tr>
<tr>
<td></td>
<td>2-Hydroheptafluoropropane</td>
</tr>
<tr>
<td></td>
<td>Heptafluoropropane</td>
</tr>
<tr>
<td></td>
<td>2-H-heptafluoropropane</td>
</tr>
<tr>
<td></td>
<td>1,1,1,2,3,3,3-Heptafluoropropane</td>
</tr>
<tr>
<td></td>
<td>R-227</td>
</tr>
<tr>
<td></td>
<td>R227</td>
</tr>
<tr>
<td></td>
<td>HFC-227ea</td>
</tr>
<tr>
<td>MSDS Number</td>
<td>130000036866</td>
</tr>
<tr>
<td>Product Use</td>
<td>Fire extinguishing agent</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>DuPont</td>
</tr>
<tr>
<td></td>
<td>1007 Market Street</td>
</tr>
<tr>
<td></td>
<td>Wilmington, DE 19898</td>
</tr>
<tr>
<td>Product Information</td>
<td>1-800-441-7515 (outside the U.S. 1-302-774-1000)</td>
</tr>
<tr>
<td>Medical Emergency</td>
<td>1-800-441-3637 (outside the U.S. 1-302-774-1139)</td>
</tr>
<tr>
<td>Transport Emergency</td>
<td>CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)</td>
</tr>
</tbody>
</table>

### SECTION 2. HAZARDS IDENTIFICATION

#### Emergency Overview
- Misuse or intentional inhalation abuse may lead to death without warning.
- Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Rapid evaporation of the liquid may cause frostbite.

#### Potential Health Effects

| Skin                  | Contact with liquid or refrigerated gas can cause cold burns and frostbite. |
Eyes: Contact with liquid or refrigerated gas can cause cold burns and frostbite.

Inhalation: Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects. Other symptoms potentially related to misuse or inhalation abuse are: Anaesthetic effects, Light-headedness, dizziness, confusion, incoordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Carcinogenicity
None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2,3,3,3-Heptafluoropropane</td>
<td>431-89-0</td>
<td>100 %</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

Skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Take off all contaminated clothing immediately. Consult a physician. Wash contaminated clothing before re-use. Treat for frostbite if necessary by gently warming affected area.

Eye contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Consult a physician if necessary.

Inhalation: Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.
Ingestion: Is not considered a potential route of exposure.

General advice: Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.

Notes to physician: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

SECTION 5. FIREFIGHTING MEASURES

Fire and Explosion Hazard: The product is not flammable. Hazardous decomposition products: Hydrogen fluoride, Carbonyl fluoride

Suitable extinguishing media: This material is a fire extinguishing agent.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel): Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Keep upwind of leak - evacuate until gas has dispersed.

Spill Cleanup: Ventilate area using forced ventilation, especially low or enclosed places where heavy vapors might collect.

SECTION 7. HANDLING AND STORAGE

Handling (Personnel): Do not breathe gas. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8. Wash hands thoroughly after handling. Wash clothing after use. Decomposition will occur when product comes in contact with open flame or electrical heating elements. Handle in accordance with good industrial hygiene and safety practice.
Storage : Valve protection caps and valve cutlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Keep at temperature not exceeding 52°C. Do not store near combustible materials. Keep container tightly closed in a dry and well-ventilated place. Store in original container. Protect from contamination. Avoid area where salt or other corrosive materials are present.

Storage temperature : < 52 °C (< 126 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls : Use only with adequate ventilation. Keep container tightly closed.

Personal protective equipment

Respiratory protection : Wear NIOSH approved respiratory protection as appropriate.

Hand protection : Additional protection: Impervious gloves

Eye protection : Safety glasses with side-shields Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

Skin and body protection : Where there is potential for skin contact, have available and wear as appropriate, impervious gloves, apron, pants, jacket, hood and boots.

Protective measures : Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines

Exposure Limit Values

<table>
<thead>
<tr>
<th>Substance</th>
<th>AEL *(DUPONT)</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2,3,3,3-Heptafluoropropane</td>
<td>1,000 ppm</td>
<td>8 &amp; 12 hr. TWA</td>
</tr>
</tbody>
</table>
* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquefied gas</td>
</tr>
<tr>
<td>Odor</td>
<td>none</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-131 °C (-204 °F)</td>
</tr>
<tr>
<td>Boiling point</td>
<td>-16.3 °C (2.7 °F)</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>4,547 hPa at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Density</td>
<td>1.388 g/cm³ at 25 °C (77 °F)</td>
</tr>
<tr>
<td></td>
<td>(as liquid)</td>
</tr>
</tbody>
</table>

**SECTION 10. STABILITY AND REACTIVITY**

- **Stability**: Stable at normal temperatures and storage conditions.
- **Incompatibility**: Alkali metals, Alkaline earth metals, Powdered metals, Powdered metal salts
- **Hazardous decomposition products**: Hazardous decomposition products, Hydrogen fluoride, Carbonyl fluoride, Carbon monoxide, Carbon dioxide
- **Hazardous reactions**: Polymerization will not occur.

**SECTION 11. TOXICOLOGICAL INFORMATION**

- **FM-200®**
  - **Inhalation 4 h LC50**: > 788698 ppm, rat
  - **Inhalation**: dog
  - **Cardiac sensitization**: not applicable
  - **Dermal**: not applicable
  - **Oral**: not applicable
  - **Skin irritation**: No skin irritation, Not tested on animals
Material Safety Data Sheet

**FM-200®**

Version 2.1

Revision Date 07/11/2011   Ref. 130000036866

Not expected to cause skin irritation based on expert review of the properties of the substance.

Eye irritation : No eye irritation, Not tested on animals
Not expected to cause eye irritation based on expert review of the properties of the substance.

Sensitisation : Does not cause skin sensitization., Not tested on animals
Not expected to cause sensitization based on expert review of the properties of the substance.

Did not cause sensitization on laboratory animals. There are no reports of human respiratory sensitization.

Repeated dose toxicity : Inhalation rat
No toxicologically significant effects were found.

Carcinogenicity : Overall weight of evidence indicates that the substance is not carcinogenic.

Mutagenicity : Did not cause genetic damage in animals.
Did not cause genetic damage in cultured mammalian cells.
Did not cause genetic damage in cultured bacterial cells.

Reproductive toxicity : Animal testing showed no reproductive toxicity.
Information given is based on data obtained from similar substances.

Teratogenicity : Animal testing showed no developmental toxicity.

Further information : Cardiac sensitisation threshold limit : 730190 mg/m3

---

**SECTION 12. ECOLOGICAL INFORMATION**

Aquatic Toxicity

FM-200®

96 h LC50 : Danio rerio (zebra fish) > 200 mg/l
Information given is based on data obtained from similar substances.

96 h LC50 : Oncorhynchus mykiss (rainbow trout) > 81.8 mg/l
Information given is based on data obtained from similar substances.

72 h EC50: Pseudokirchneriella subcapitata > 114 mg/l
Information given is based on data obtained from similar substances.

72 h EC50: Pseudokirchneriella subcapitata > 118 mg/l
Information given is based on data obtained from similar substances.

48 h EC50: Daphnia magna (Water flea) > 200 mg/l
Information given is based on data obtained from similar substances.

48 h EC50: Daphnia magna (Water flea) > 97.9 mg/l
Information given is based on data obtained from similar substances.

Environmental Fate
FM-200®
Biodegradability aerobic: 1 % OECD Test Guideline 301
Not readily biodegradable.

Biodegradability aerobic: 5 % OECD Test Guideline 301
Not readily biodegradable.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal: Can be used after re-conditioning. Recover by distillation or remove to a permitted waste disposal facility. Comply with applicable Federal, State/Provincial and Local Regulations.

Environmental Hazards: Empty pressure vessels should be returned to the supplier.

SECTION 14. TRANSPORT INFORMATION

DOT UN number: 3296

Proper shipping name: Heptafluoropropane

Class: 2.2

Labelling No.: 2.2

IATA_C UN number: 3296
Proper shipping name : Heptafluoropropane
Class : 2.2
Labelling No. : 2.2
UN number : 3296
Proper shipping name : Heptafluoropropane
Class : 2.2
Labelling No. : 2.2

SECTION 15. REGULATORY INFORMATION

SARA 313 Regulated Chemical(s) : SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65 : Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known

SECTION 16. OTHER INFORMATION

HMIS

Health : 1
Flammability : 0
Reactivity/Physical hazard : 0
PPE : Personal Protection rating to be supplied by user depending on use conditions.

FM-200 is a registered trademark of E. I. du Pont de Nemours and Company
Before use read DuPont's safety information.
For further information contact the local DuPont office or DuPont's nominated distributors.
DuPont's registered trademark

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing,
storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Significant change from previous version is denoted with a double bar.
THE MOST TRUSTED
FIRE SUPPRESSION SYSTEMS
ON THE MARKET

ECARO®

FM-200®

HFC-227ea

CLEAN AGENT FIRE SUPPRESSION
WITH Impulse TECHNOLOGY®
Imagine your company’s valuable data, equipment and systems lost to fire. How many enterprises, businesses and customers would be negatively impacted if your equipment or network were to go down? And how quickly could you get back on line ... if at all? Even one day lost to fire-related downtime can mean lost revenues, customers and profits.

You know you should protect against fire. But, basic water type fire suppression systems (sprinklers) can cause even more damage than the fire itself. Gaseous clean agent fire suppression systems have long been the answer to protecting high-end equipment, electronics and irreplaceable items from fire and the damaging effects of water.

**FIKE CLEAN AGENT SYSTEMS FEATURING IMPULSE VALVE TECHNOLOGY**

Known worldwide for high quality and dependable systems, Fike’s clean agent offering includes ECARO-25®, HFC-227ea and DuPont™ FM-200®... now featuring the exclusive IMPULSE Valve Technology.
Simply said, **ECARO-25** is the best way to suppress fires and protect your high-value assets and business continuity.

All clean agents must remain in the protected space for a specified period of time in order to extinguish a fire. Thanks to the unique physical properties of the **ECARO-25** agent, the hold time in a 5000 cubic foot enclosure is 27 minutes, compared to a 12 minute hold time for an HFC-227ea system and a 10 minute hold time for a FK-5-1-12 system. **ECARO-25** offers a far superior hold time, allowing more time for trained personnel response and minimal chance for any fire re-ignition.

In addition, **ECARO-25** requires 10% less agent per cubic foot/meter than HFC-227ea systems and 37% less clean agent per cubic foot/meter than FK-5-1-12.

The superior properties of our unique system allow you to utilize small diameter piping over long distances, making it easier and less expensive to design your clean agent pipe network. With **ECARO-25**, you spend less money on the agent, piping and installation … making it the most cost-effective clean agent fire suppression system available today.

**THE EASIEST REPLACEMENT FOR HALON 1301**

Due to the physical properties of FE-25 and the superior performance of the Impulse Valve Technology, **ECARO-25** can often work with your existing Halon pipe network. With **ECARO-25**, you can easily transform your old Halon 1301 fire suppression system into an effective, environmentally-sound clean agent system, with minimal system modifications.

**ECARO-25 is the easiest and most cost effective replacement for existing Halon 1301 fire protection systems.**
CLEAN AGENT FIRE SUPPRESSION

HFC-227ea, trademarked by DuPont™ as FM-200®, is accepted and respected worldwide, including a long history of protecting some of the world’s most critical and irreplaceable assets. Fike’s clean agent system, which includes the use of HFC-227ea and FM-200, extinguishes a fire quickly by discharging in 10 seconds or less … stopping ordinary combustible, electrical, and flammable liquid fires before they can cause significant damage. When fire is extinguished this quickly, in addition to less fire damage, you’ll likely have no downtime and/or disruption of business.

Safe for use where people are present, Fike’s clean agent system removes heat and breaks up the fire at the molecular level. And because it discharges as a gas, it leaves no residue and doesn’t require costly clean-up like water or dry chemical systems. Perhaps the most well respected and globally recognized of all clean agent fire suppressants, HFC-227ea applications range from computer and electronic rooms to museums and military vehicles.

CLEAN AGENT FIRE PROTECTION
IS BEST FOR ELECTRONICS AND HIGH VALUE ASSETS

Basic water type fire suppression systems (sprinklers), are designed to protect people and structures. But, when it comes to protecting archives, telecommunications, high value assets, computers and other electronic equipment, water can be more damaging than the fire itself.

Gaseous chemical suppression systems (clean agent systems) have been used for more than 50 years to protect electronics and other valuables that are susceptible to the damaging effects of water-based suppression systems. Clean agent systems such as ECARO-25, HFC-227ea, and DuPont FM-200, are superior to water and dry chemicals in virtually every way:

- Clean agents are not electrically conductive, and do not damage electronics — water is a great conductor and ruins electronics!
- Clean agents are safe for people.
- Clean agents leave no residue and require no clean-up.
- Because they act quickly, clean agents greatly reduce the amount of smoke and soot damage caused by a fire.
- Clean agents provide three-dimensional suppression, extinguishing fires where water cannot penetrate.
IMPULSE VALVE TECHNOLOGY

A clean agent fire suppression valve controls the pressure within the container and the efficiency with which the system discharges. The Fike Impulse Valve greatly improves the performance of clean agent fire suppression systems over mechanical valve systems by combining the reliability and efficiency of a rupture disc and the flexibility of electric actuation.

With over 65 years experience in engineering pressure relief systems, Fike is THE leader in rupture disc technology. Capitalizing on that experience, and after extensive engineering and testing, Fike has designed the most effective fire suppression container valve available. Impulse Technology combines the highest standards for performance with simplified operation and maintenance.

- Easier/less expensive to ship
- Capability to manually activate
- Replacement is easy and less expensive
- Resettable actuation device
- Easier filling
- Easy field testing capability
- Simplified service
- UL Listed and FM Approved

The simplicity of the valve means fewer parts to maintain and greater reliability. As a result of Fike’s advanced rupture disc technology, there is less pressure loss. That efficiency translates into a fire protection system with longer pipe run capability and flexible installation options.

The Impulse Valve can be configured to operate in multiple ways – electric, pneumatic or a combination of both. The Impulse Valve is capable of firing up to 6 cylinders on a single releasing circuit – making systems with this advanced actuation more cost-effective to design and install.

VERSATILE, EFFICIENT, COST-EFFECTIVE ... IMPULSE
WE’RE PROUD OF OUR RESUME

EXPERIENCED: We’ve worked in the fire protection business since 1960.

FOCUSED: We specialize in Life Safety Products, as well as Facility and Asset Protection Products.

VERSATILE: We design, manufacture, distribute and maintain our products.

GLOBAL: We have clients, manufacturing facilities, sales outlets and maintenance companies around the world.

INNOVATIVE: In 1994, we became the first manufacturer to bring a UL Listed and FM Approved, clean agent fire suppression system to market, replacing Halon.

EARTH-FRIENDLY: We pioneered the development of clean agent systems and we continue to develop other environmentally safe alternatives such as our superior inert gas system.

COMPREHENSIVE: Fike has a worldwide network of experienced distributors each with a staff of factory trained technicians to meet your installation and service requirements.
UNPRECEDENTED SPEED

ULTIMATE POWER

EXTREME INTELLIGENCE
Fike offers you a revolutionary advancement in fire safety and protection. Our innovative Cheetah Xi system saves lives and valuable assets through its unprecedented speed, intelligence and flexibility.

**CHEETAH XI IS A DIGITAL, PEER-TO-PEER, BI-DIRECTIONAL COMMUNICATION SYSTEM.** Our state-of-the-art control system is the right choice for your next installations of Fire Alarm, Clean Agent Suppression, Carbon Dioxide Suppression, Watermist and Sprinkler/Pre-Action:

**EXTREME PROTECTION —**
- 6.0 amp power supply, Expandable to 12 (5.25 amp with CheetahXi 50)
- 80-character LCD with 10 status LEDs to provide instant visual information
- 3200-event history buffer
- Optional internal point ID DACT
- NAC circuits provide built-in synchronization and multiple output patterns via control modules
- (2) SLCs standard, expandable to (4)
- SLC loop has a maximum length of 12,000'
- Supports 254 devices per SLC, any combination of sensors or modules (CheetahXi 50 supports 50 devices)
- Networkable up to 128 nodes including other Cheetah Xi panels as well as the CyberCat 1016 and 254 Fire Alarm panels
- Positive alarm sequence

**FASTER RESPONSE,**
- Up to 4,000’ of wire between network nodes
- Unique digital peer-to-peer operation with intelligence in the field devices, not just the control panel
- Full integration with FAAST intelligent air sampling products
- Sensors and modules available with built-in isolators for limited isolation or true Style 7 isolation
- Up to 253 zones to map initiating devices to control functions
- Releasing function provides three input types; cross zone, counting zone and single detector, and 6 abort types
- Four levels of password protection with built-in individual user profiles
- Style 4, 6, or 7 wiring capability

**TWICE THE CAPACITY,**
- Integral sensitivity testing
- Drift compensation
- Manual sensitivity adjustments
- Day/Night sensitivity adjustments
- Multi-colored LEDs that provide you instant status of devices

**MORE INTELLIGENCE**
- Programmable remote LEDs
- Alarm verification for alarm zones
- Early warning option (summing up to 8 sensors)
- Built-in acclimate feature

**SPLIT-SECOND SPEED**

**WHEN SMOKE AND FIRE THREATEN ASSETS CRITICAL TO THE SUCCESS AND OPERATION OF YOUR BUSINESS, REACTION TIME IS CRUCIAL.**

In just ten seconds, profound loss can occur. That’s why we’ve designed Cheetah Xi detection and suppression panels to respond faster than the industry requires. With a Cheetah Xi system in your facility, the response time between the initiation of an alarm to the activation of output devices occurs in as little as one-quarter second.

**HOW DOES FIKE DELIVER SUCH INCREDIBLE SPEED?** Fike’s Cheetah Xi system eliminates polling delays and interference. Information is delivered simultaneously from the intelligent sensors to the suppression panel and other devices within the system. This direct communication achieves response times that are lightning fast.

**CHEETAH XI SENSOR FUNCTIONS**
- Integral sensitivity testing
- Drift compensation
- Manual sensitivity adjustments
- Day/Night sensitivity adjustments
- Multi-colored LEDs that provide you instant status of devices
Fike’s intelligent Cheetah Xi system turns every device into a peer. These peers not only communicate up-to-the-second information to the control panel, they also communicate with each other.

Each device is capable of generating accurate and highly detailed information. Conventional systems give you a general idea of a fire’s location — for example, the second floor of your building. Cheetah Xi’s intelligent sensors tell you precisely which device is in alarm and specific information on that hazard — for example, a specific location on the second floor.

In addition, Cheetah Xi modules can be programmed or tied in to other systems such as:

- Shutdowns
- Voice Evacuation Systems
- Doors
- Releasing of Clean Agent Suppression, Carbon Dioxide Suppression, Watermist, Foam, and Sprinkler / Pre-Action
- HVAC / Smoke Control
- Dampers
- Elevators
- Security / CCTV / Building Management Awareness

**FIRE SUPPRESSION SOLUTIONS THAT FIT YOUR NEEDS**

The Cheetah Xi gives you the freedom to design the ideal system for your facility. The 1016 system comes standard with two Signaling Line Circuits (expandable to four loops) that support 254 devices each. And you can network up to 128 Cheetah Xi’s and/or the Fike CyberCat fire alarm panels, for up to any combination of 130,048 sensors and modules!

The Cheetah Xi 50 intelligent fire suppression system, brings all that power and technology to stand-alone or smaller business applications. Flexible, fast and efficient, the Cheetah Xi 50 is the economical choice.

**SAME SPEED. SAME INTELLIGENCE. SAME GREAT VALUE.**
Cheetah Xi gives you the freedom to design the ideal system for your facility. You can easily control just a few devices or up to 130,048 devices. Plus, you can mix and match sensors and modules in virtually any combination needed for your specific application. With Cheetah Xi, the possibilities are endless.

**STANDALONE SYSTEMS**

**CHEETAH Xi 1016**
- 2 Signaling Line Circuits (SLCs) expandable to 4
- Supports up to 1,016 devices
- Any combination of sensors and modules
- Supports up to 31 Remote Annunciators

**CHEETAH Xi 50**
- 1 Signaling Line Circuits (SLC)
- Supports up to 50 devices
- Any combination of sensors and modules
- Supports up to 31 Remote Annunciators

**NETWORK SYSTEMS**

**CHEETAH Xi SYSTEM NETWORK WITH FIKE CYBERCAT® FIRE ALARM PANELS**
- Connects up to 128 Cheetah Xi control panels and CyberCat panels in any combination
- Supports 130,048 devices
- Any combination of sensors and modules

**EXTREME SAFETY**
CHEETAH Xi PERFORMS OPERATIONS WITH SPEED, INTELLIGENCE AND FLEXIBILITY
Our intelligent Cheetah Xi system can be programmed to relay information and perform process management tasks. Fike can help you design the ideal Cheetah Xi system for your facility.

ONE PANEL FITS ALL YOUR NEEDS FOR LIFE SAFETY AND FIRE PROTECTION
CHEETAH Xi – ONE PANEL FITS ALL YOUR NEEDS FOR LIFE SAFETY AND FIRE PROTECTION