

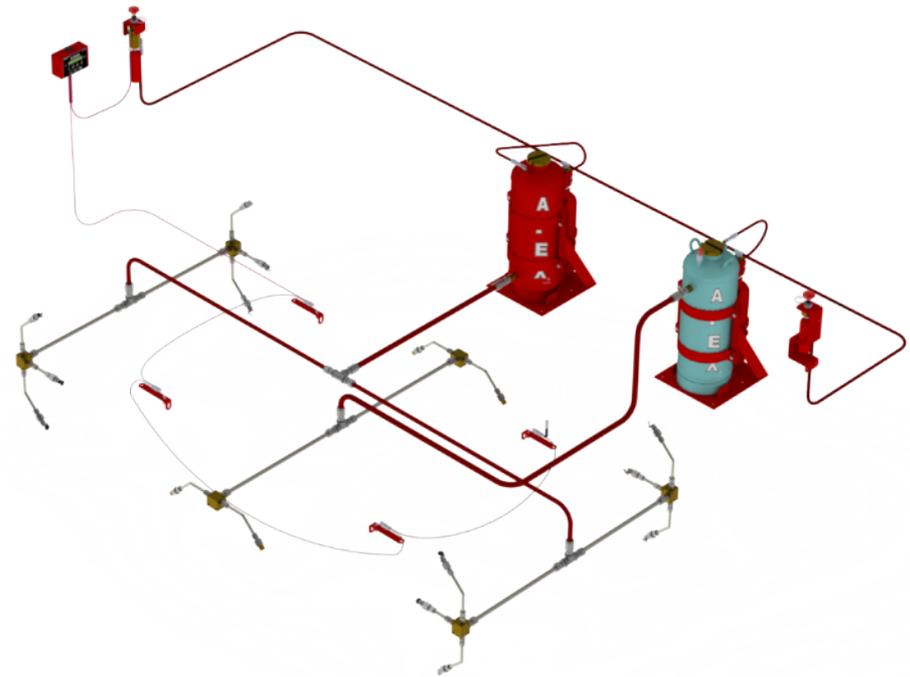


AFEX

FIRE SUPPRESSION SYSTEMS



VEHICLE FIRE SUPPRESSION 101



Our Qualifications: Who Is AFEX?

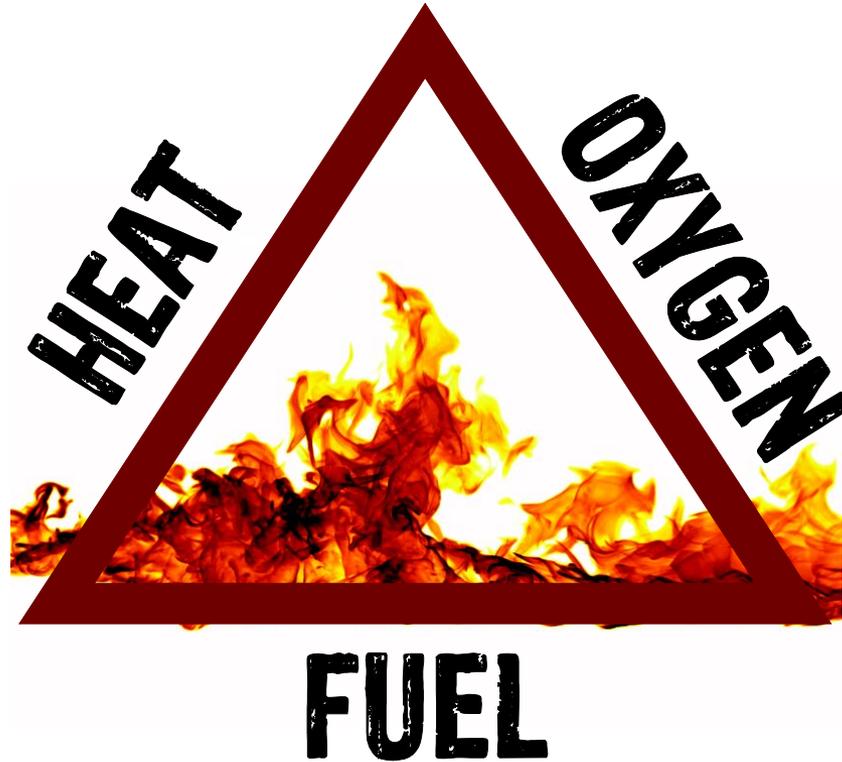
- **AFEX is a privately owned American manufacturer of robust, purpose-built fire suppression systems.**
- **We are the only fire protection company that:**
 - Specializes in protecting off-road equipment.
 - Dedicates 100% of its resources to this focus.
 - Has been doing this, and only this, for over 45 years.
- **The company is comprised of off-road heavy equipment experts who specialize in fire suppression systems.**
- **Our product carries numerous third-party certifications that have been earned through decades of development.**

What Is Fire Suppression?



- **Why is it needed?**
- **Who uses it?**
- **How does it work?**

The Anatomy of a Fire



All three components must be present for a fire to start or continue to burn. It can be prevented if any one is removed.

Fire Type Classifications

CLASS A FIRES

Ordinary combustibles (debris):
wood, paper, fabric & plastics

CLASS B FIRES

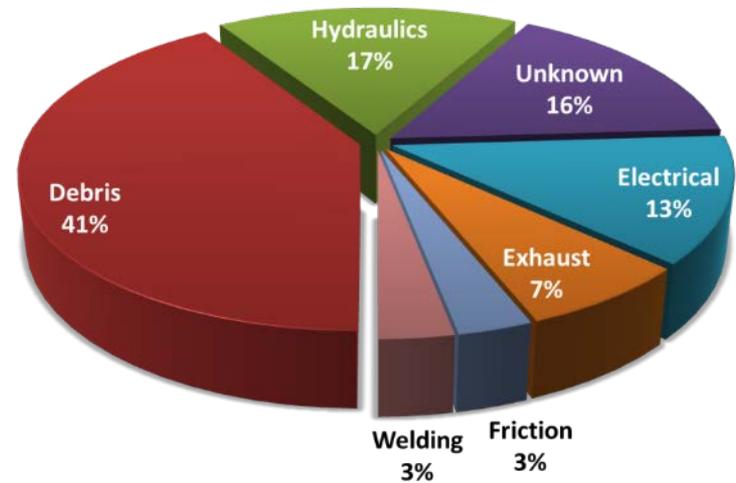
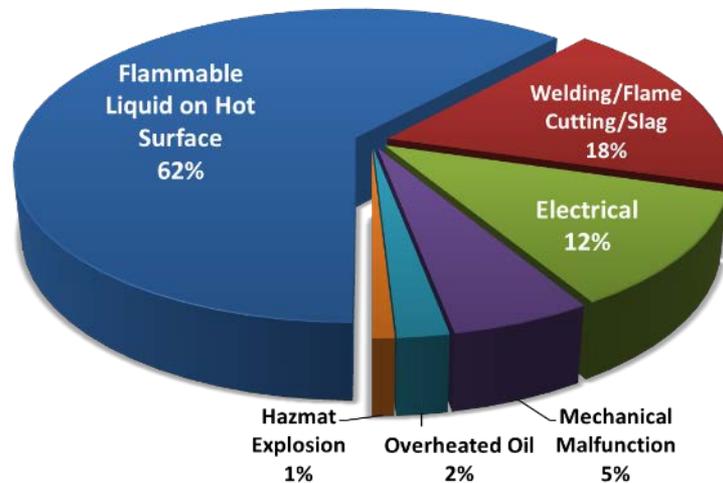
Combustible liquid or gas

CLASS C FIRES

Fires in “live” electrical equipment

Fire Prevention 101

- Fuel for a fire is the wildcard which creates the need for fire suppression systems. **MINING FIRES vs. FORESTRY FIRES**



- Keeping a machine clean and in good working condition is the best way to prevent fires, since it is not possible to eliminate either oxygen or heat when dealing with working equipment.

Drawbacks of an Equipment Fire

- **Injury to operators from burns, falls or smoke inhalation.**
- **Damage to the equipment / loss of the equipment.**
- **Damage to surrounding equipment, structures, or to the resource from a spreading fire.**



- **Loss of production equals loss of revenue and profitability.**
- **Increased cost or loss of insurance.**
- **Loss of a job and/or compromised ability to get future work.**

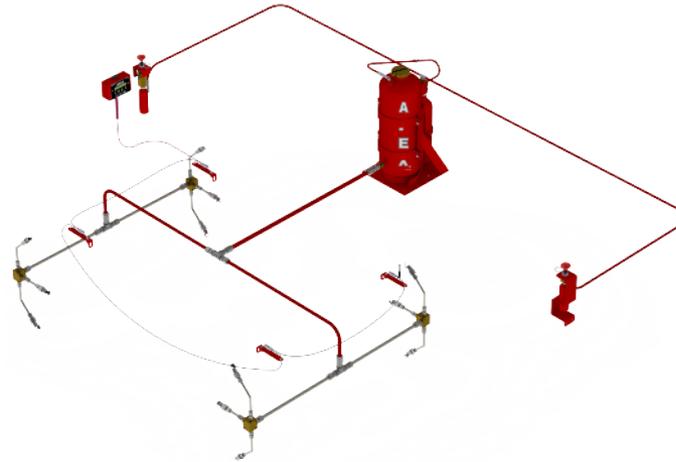
Industries That Use Fire Suppression



- Mining
- Forestry
- Waste
- Steel & Slag
- Pulp & Paper

- Other Applications
 - Gensets
 - Transportation
 - Agriculture
 - Oil, Gas, and Energy

What Is a Fire Suppression System?

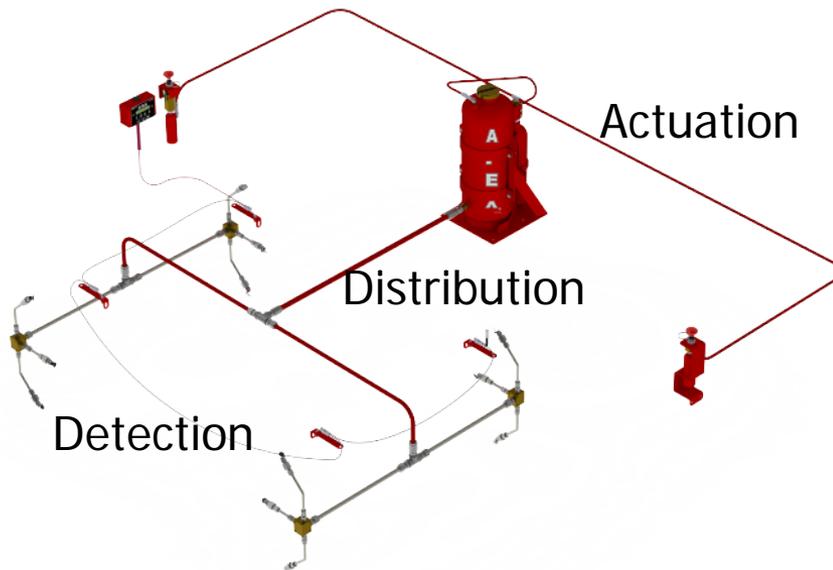


- A fire suppression system is a safety accessory which is installed on a vehicle or piece of off-road heavy equipment; it consists of detection, actuation, and distribution components.
- It is designed to reduce damage and losses related to fire.
- *Not all fire suppression systems are created equal.*

What to Look For in a Fire System

- **Suppression systems cannot protect a machine if they break down in the field, so a robust and proven product is needed. Third-party certifications help identify these brands.**
- **Purpose-built systems designed for the heavy industries are longer lasting and more rugged.**
- **Not all manufacturers are readily available with expert factory support and dedicated customer service. It's best to choose a company that is accessible to its customers.**

System Features & Options



- **Automatic / Manual Detection and Actuation**
- **Monitoring Alarm Panel**
- **Cab Actuator**
- **Remote Actuators**
- **Engine Shutdown**
- **Dry Chemical Agent A:B:C**
- **Liquid A:B Agent**

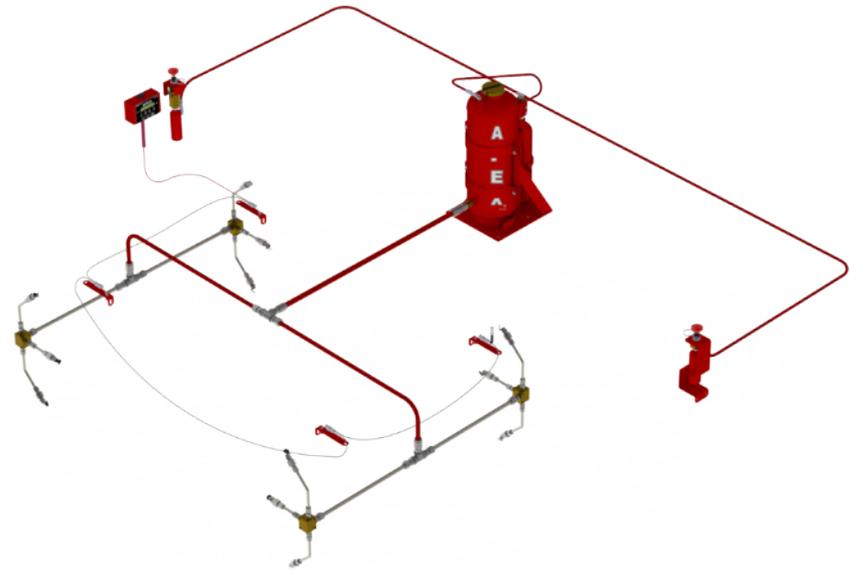
AFEX Control Unit



- Combines micro-processor technology with AFEX durability for ultimate fire suppression system control and performance.
- Provides advanced visibility and telematics connectivity.
- Internal data log for system troubleshooting.
- Capable of standalone operation.

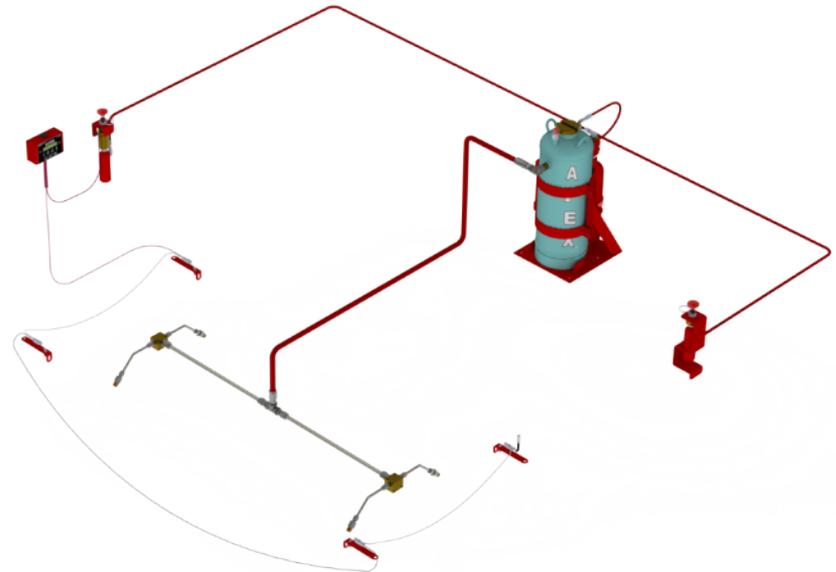
System Types: Dry Chemical Agent

- **Effective against Class A, Class B, and Class C fires**
- **Total -flooding system for fighting 3D fires**
- **Fast fire knockdown**
- **Best coverage/footprint ratio. Coverage is by square foot or component**
- **Ideal for protecting engine and transmission compartments**



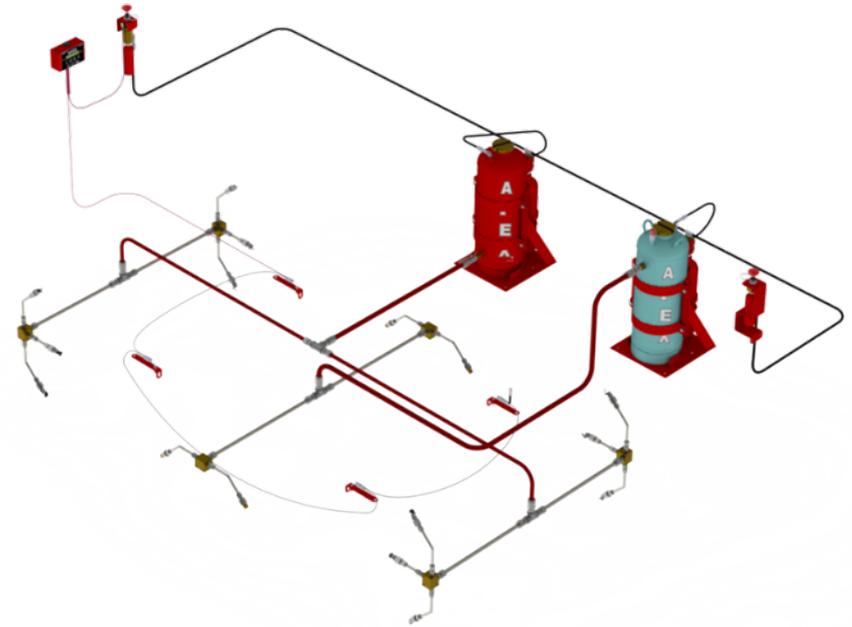
System Types: Liquid Agent

- **Effective against Class A and Class B fires (flammable or combustible liquid or gas)**
- **Combines fire knockdown with excellent cooling**
- **Effective at temperatures as low as -40°F (-40°C)**
- **Ideal for suppressing fires and cooling hot surfaces, as well as protecting open areas**



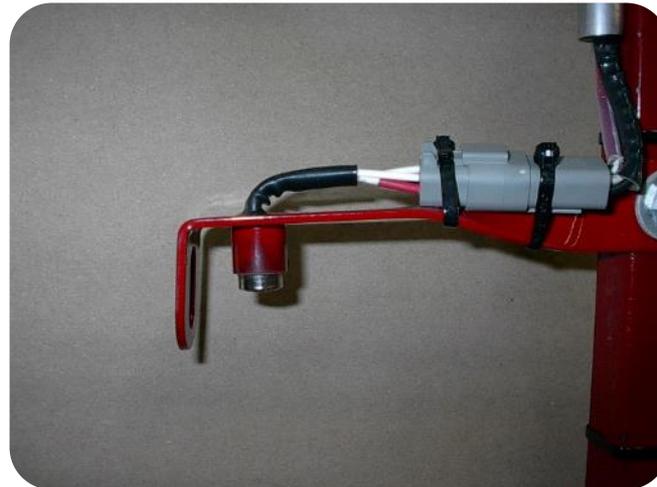
System Types: Dual Agent

- **Combines the benefits of A:B:C Powder and Liquid Agent**
- **“The right agent for the right job”**
- **Ideal for Tier 4, some hybrid powertrains, and other machines with large amounts of hot surfaces, high pressure hydraulics and debris build up**



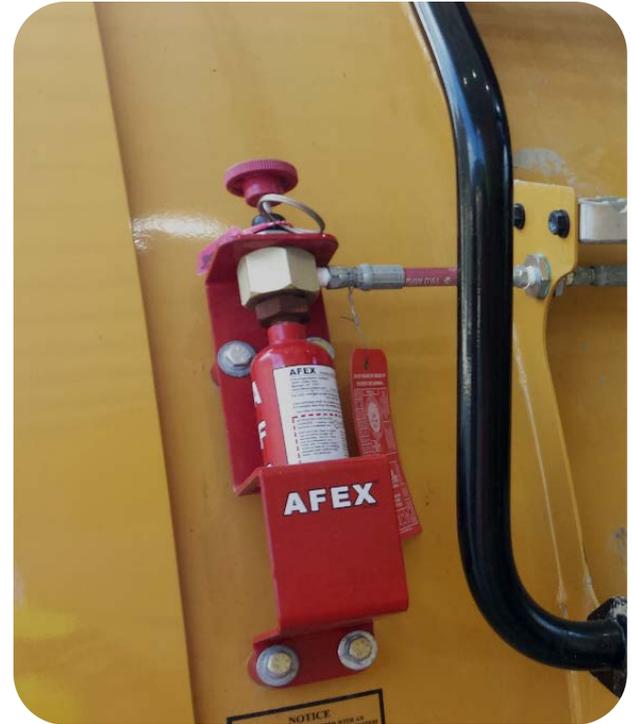
How a System Works: Detection

- **The first step in the suppression process is determining that a fire has broken out.**
 - Automatic systems are preferred in applications where the operator has limited or no view of the high risk fire areas of the machine.
 - Automatic systems monitor constantly, protecting the machine 24/7.
 - Manually actuated systems are appropriate in certain circumstances. An example would be in a high heat environment.



How a System Works: Initial Actuation

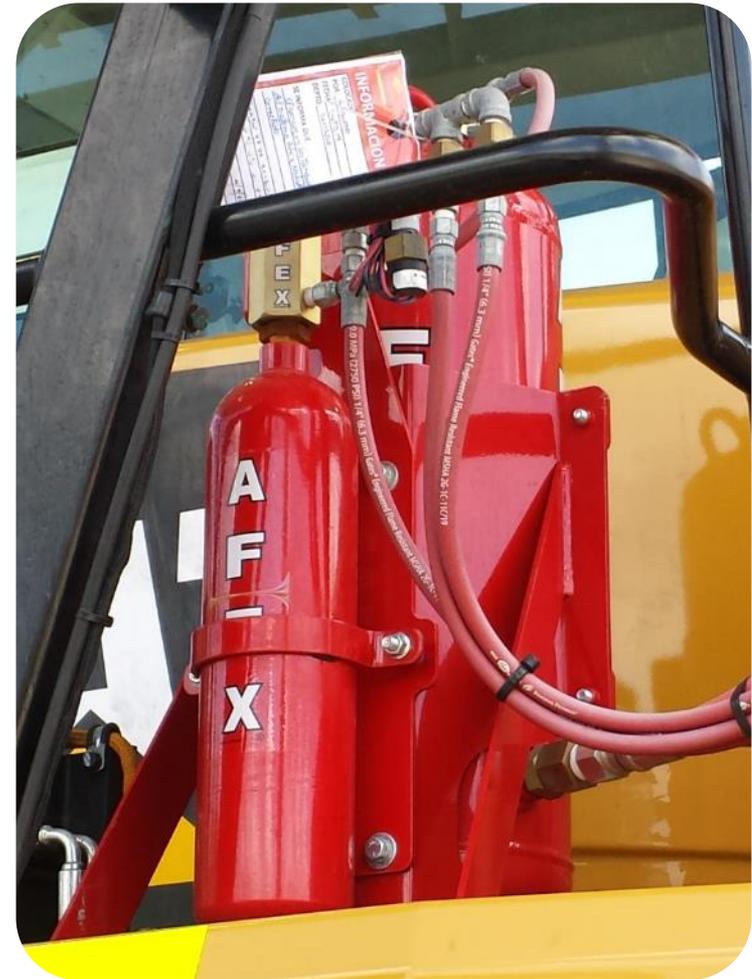
- **An automatic system actuates itself once the detection circuit is tripped, signaling a fire.**
- **A manual system relies on an operator. It can be actuated by depressing the plunger of either a cab or remote actuator mounted on the exterior of the machine.**
 - **Ground level actuators ensure that operators do not need to enter the cab in order to activate the system.**



How a System Works: Discharge

- Once the system has been actuated, the seal is broken on the nitrogen cartridge.

This pressurizes the agent tanks and propels the fire-fighting material through the distribution network.



How a System Works: Distribution

- The agent is discharged into the protected areas of the machine (typically the engine and transmission compartments) through a series of hoses and tubing to nozzles which disperse the fire-fighting material.



Pre-shift Fire Suppression System Checklist

- There are no signs of a fire having occurred.
- There is no sign of dry chemical or liquid agent indicating a system discharge.
- The safety pin and seal are in place on all actuators.
- Control Unit
 - The power light is blinking (Control Unit) or illuminated (CMP).
 - The unit displays “AFEX CONTROL UNIT ACTIVELY MONITORING” with no other messages when INFO is pressed (Control Unit) or there are no trouble lights illuminated (CMP).
- The system’s audible alarm is silent.
- There is no damage to system components:
 - Agent tanks and brackets
 - Hose and fittings
 - Detection
 - Actuators and brackets
 - Nozzles
- The system components are not in contact with other parts of the machine.
- The portable extinguisher is charged and in place.
- All required repairs have been made.

Fire Suppression System Operation

- 1. Bring the vehicle to a complete stop.**
- 2. Turn off the motor and set the brake.**
- 3. Manually actuate the fire suppression system.**

Even if your system is equipped with an automatic actuation package **DO NOT** wait for the system to automatically actuate.

- 1. Remove pin from the actuator.**
- 2. Strike push knob with force. Use a closed fist, or the base of your palm.**
- 4. You will hear a noise from the release of the nitrogen gas.**
- 5. The agent(s) will discharge into the protected area of the machine.**

Note: The ABC dry chemical is not toxic, however it may cause temporary eye, skin, or respiratory irritation.



System Operation (continued)

- 6. Exit the machine and move to a safe distance.**
- 7. Standby with a portable extinguisher to make sure that any smoldering debris has been extinguished and there is no fire re-ignition.**
- 8. Call your local fire department and site supervisor to alert them to the situation and follow any applicable fire response procedures.**
- 9. In the event of fire re-ignition or suppression only, additional fire fighting equipment will be necessary to ensure extinguishment.**

After the Fire is Out

- 1. Use water or compressed air to clean the equipment.**
- 2. Determine the cause of the fire and make the required repairs.**
- 3. Contact your local AFEX distributor to schedule a service and recharge of your system.**



DO NOT place the vehicle back in service until it has been repaired and the cause of the fire has been determined and rectified, and the AFEX system has been serviced and recharged.

Inspections and Maintenance

- **AFEX fire suppression systems are designed and built to withstand adverse environmental and operating conditions; however, periodic inspection and maintenance is necessary to insure that the system is fully operational when required.**
- **Per NFPA 17 and 17a, the system should be inspected by a factory trained AFEX technician at least *semiannually*.**
 - Environmental and operating conditions may necessitate more frequent intervals. In our experience, a complete inspection every 3-4 months or 1,000-1,200 operating hours (whichever comes first) is optimal.

Thank You for Your Participation!

