

MICROMIST® WATER MIST FOR DIESEL ENGINES

TYPICAL INDUSTRIES SERVED

- Telecommunication
- Cogeneration
- Petrochemical
- Gas Compression
- Municipal Facilities
- Institutions

INTRODUCTION

Stationary diesel engines are utilized in a wide number of applications in industrial, commercial, marine, and municipal locations. Diesel engines are most commonly used together with a generator to produce electricity for prime or emergency conditions. Other uses consist of larger engines driving pumps and compressors used in the petrochemical and gas-pipeline transmission industries, cogeneration systems found in the industrial and large commercial facilities, and back-up power for operations that can't allow the loss of electricity. In a deregulating power industry, companies are addressing the uncertainties of the reliability of the power supply by implementing their own independent means of power. This has increased the use of diesel generators.

The loss of electrical power ultimately leads to business downtime. The cost of downtime can be devastating to a company. A business' main or backup power supply surviving a fire depends upon proper fire protection. This application profile will discuss the potential fire hazards associated with diesel engines and provide protection solutions utilizing the Fike Micromist Water Mist Extinguishing System. This document is intended to be a guideline and is not applicable to all installations. Fike's Micromist Design, Installation, and Maintenance Manual and NFPA 750 shall be referred to when designing Water Mist Systems. If you have any questions, please contact the Fike Technical group, or our regional sales manager in your area.

THE PROBLEM: FLAMMABLE AND COMBUSTIBLE LIQUID FIRES

There are many different size diesel engines used in various applications operating on various distinct fuels. The most common types of fuels are flammable and combustible liquids. Regardless of size or fuel type, the fire hazard present with diesel engine applications mainly revolves around the fuel and lubrication system. Fire hazards associated with stationary engines are:

- Ignition of combustible liquids and flammable gases used as fuel.
- Hydraulic fluids, lubricant and occasionally the material being pumped or compressed.
- Temperature of the engine parts or exhaust reaching a high enough temperature to ignite combustible or flammable products.
- Ignition of flammable vapors or combustible materials stored within the engine room.
- Pools of fuel leakage on equipment surfaces and/or the floor of the enclosure.
- Spray fires due to a rupture of pressurized suction and return fuel lines.

Failure to allow sufficient clearance between the exhaust piping and combustible walls, ceilings, or roofs can also lead to a fire. Manifolds, mufflers, and exhaust piping can easily reach temperatures of 1,000°F (538°C), and require special precautions when penetrating combustible construction.

THE SOLUTION: TOTAL COMPARTMENT PROTECTION

Fike's Micromist Water Mist System is the right choice to protect diesel engines against fire. Water Mist is the desirable agent for use in the protection of diesel engines because of minimal clean up associated with a system discharge, the removal of the life safety concern, no environmental impact, and the availability of agent for recharge not being an issue. Diesel engine enclosures are often well ventilated to prevent temperature build up and to keep the area cool during operation. The Micromist System has proven effective with well ventilated areas, although it is good fire protection practice to shut down ventilation and other openings prior to system discharge.

Total compartment protection is implemented when protecting diesel engines. The Micromist systems are offered in 70 and 112 gallon (265 and 425 liter) configurations. Each system package is skid-mounted and includes all necessary valves and actuation components for system operation. System nozzles, with a maximum flow rate of 2.1 gal./min (8 liters/min) of water at 310 psi (21 bar), are ceiling mounted similar to sprinkler or clean agent nozzles.

Each Micromist system package is pre-assembled and tested to ensure system reliability and simplify installation. The Micromist system utilizes relatively short durations of water discharges called cycling to aid in the extinguishment of fires. The cycling time for protection of machinery spaces provides enough water for 10 minutes of protection. Refer to the Micromist design manual for more details on cycling.

In addition to installing a Fike Micromist System, other safeguards should be considered if not implemented. Fuel pumping to the engines should be provided with a shutoff valve and located remote from the engine room. A means of spill containment should be considered around the day fuel tank as well as the central fuel storage located outside of the engine enclosure.

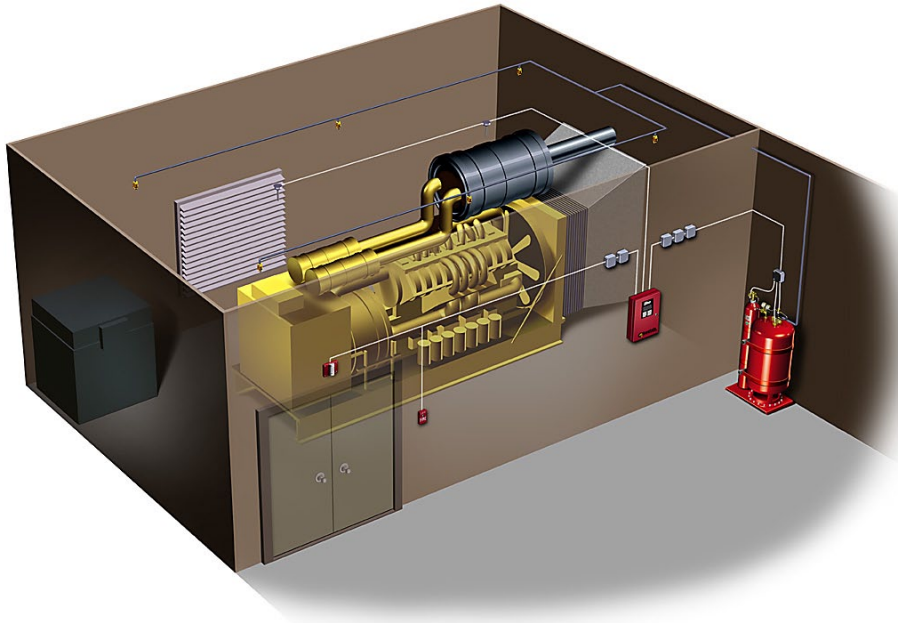
DETECTION AND CONTROLS

Form No. WAP 005

Due to a high presence of fumes, fixed temperature heat detection is the methodology of choice when protecting diesel engine applications. When analyzing a project, consideration shall be given to normal temperatures incurred during system operation as well as ventilation inside the protected area.

The Cheetah®/Cheetah® Xi control panel shall be utilized to handle the inputs and outputs required for a Micromist system in a diesel engine application. The Cheetah/Cheetah Xi control panel comes equipped to shut down ventilation, shutoff fuel supplies, and other programmable functions to satisfy various needs and operations.

Audible and visual devices are installed to notify personnel of the fire condition. A manual release station is conveniently located to allow personnel electrical manual system operation. The Cheetah control panel relay contacts can be tied into the facility fire alarm system notifying personnel of a trouble or alarm condition. This will provide proper response in the event of a fire.



"Diesel Engine" Protected by a Fike Micromist Extinguishing System