



Report of Materials and Equipment Acceptance Division

NYC Department of Buildings
280 Broadway, New York, NY 10007
Robert D. LiMandri, Acting Commissioner
(212) 566-5000, TTY: (212) 566-4769

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use subject to the terms and conditions contained herein.

MEA 28-99-E Vol. 4

Manufacturer: Marioff, Inc.
6111-M NB Hammonds Ferry Road
Linthicum, MD 21090

Trade Name(s): HI-FOG

Product: Water Mist Fire Protection System

Pertinent Code Section(s): Reference Standard RS-17 and Subchapter 17

Test(s): FMRC Fire Performance Class 5560

Laboratory: Factory Mutual Research
1151 Boston Providence Turnpike.
P.O. Box 9102, Norwood, MA. 02062

Test Report(s): Approval Report: Factory Mutual Report Project ID 3026250, Class 5560, dated November 6, 2006.

Description: The HI-FOG GPU (Gas-driven Pump Unit) Water Mist System is for the protection of combustion turbines, machinery spaces and special hazard machinery spaces in enclosures with volumes not exceeding 26,485 cubic feet. The GPU distribution system is of twin fluid, single-pipe type employing water as the liquid suppressant and nitrogen or compressed air both as the atomizing medium and the gaseous suppressant. The system is suitable for interface with Factory Mutual (FM) approved detection, control and release facilities provided by others. The system is either self-contained or to be connected to an external water supply. The system arrangement is configured using a water supply to provide the total suppressant requirement typically for at least 30 minutes for the protected volume. The system is arranged for double, yet continuous, discharge applications. The system operation does not require any electrical power. Electrical power is applied for controlling, monitoring and signaling of the system's performance in the client's contract specific requirements.

The basic system consists of the following main components: a Gas-driven Pump Unit (GPU) which comprises a mechanical, piston-type pump fully interconnected and powered by a pressurized gas cylinder unit, spray heads for discharging of water mist, stainless steel piping, control valves and an electrical control, monitoring and signaling system.

The distribution network is isolated from the pump unit by a control valve or - if divided in sections - by several control valves. In the standby position, all control valves are closed. A standby pressure of about 360 PSI (25 bar) is maintained in the system up to the control valves by a pneumatic pump. The discharge is actuated when a control valve is opened manually or, optionally, electrically from a control panel. The electric valves can be connected to a fire detection system for automatic activation. At activation, the standby pressure creates a flow of water through the relevant control valve. The water flow induces a pressure drop that opens the hydraulically operating nitrogen cylinder primary valve that starts the pump and opens the pneumatic valves of the first bank of cylinders. The pump raises the pressure in the relevant section and a pressure monitoring switch generates an indication signal to the control panel.

The system components are described in detail and are identified by part number in Marioff design, installation and maintenance manual document, reference MO/ES/24/DIOM/FM/06, rev 1.1, dated October 2006, cited in paragraph 2.1 of the Factory Mutual Approval Report.

Pursuant to "Promulgation of the Rules relating to Material and Equipment Application Procedures" dated November 5, 1992, the Bureau of Fire Prevention has no objections (letter dated June 24, 2008, F.P. Index #0806011).

Terms and Conditions: The above unit is accepted on condition that:

1. Installation of this water mist system shall be in accordance with the NYC Building Code Chapter 9 (Fire Protection Systems) and shall not be installed in lieu of sprinklers, or any other extinguishing system otherwise required by law.
2. The system shall conform to the requirements of NFPA 750 (2003) "Standard on Water Mist Fire Protection Systems".
3. The system shall be in compliance with the requirements/conditions/limitations of the Factory Mutual Research Corporation Approval Report (Project ID 3026250) Class 5560 dated November 6, 2006, including the manufacturer's design, installation, operation and maintenance manual (dated October 2006) Document Ref: MO/ES/24/DIOM/FM/06 Rev 1.1 and the applicable FM Global Property Loss Prevention Data Sheet.
4. High pressure container or cylinders shall be constructed, tested and marked in accordance with recognized, international standards, such as the U.S. Department of Transportation, 49 CFR, 171-190, 178.36-178.37, specifications (in effect upon the date of manufacture and test) for DOT-3A, 3AA-1800, or higher, seamless steel cylinders.

5. High pressure cylinders used in water mist systems shall not be recharged without a hydrostatic test if more than 5 years have elapsed from the date of the last test.
6. Only water and nitrogen/air shall be used in the system as the medium of extinguishment.
7. The system shall have a minimum of thirty minutes of protection for machinery spaces and special hazard machinery space applications. For the protection of combustion turbines, the system shall have a minimum protection time equivalent to the coast down time of the turbine or 30 minutes whichever is greater.
8. The flow of flammable liquids and electrical supply to the enclosure shall be terminated upon detection of a fire.
9. The use of ventilation shutoffs is required.
10. Spray heads just above a gas turbine must be avoided to prevent direct impingement of water onto the turbine casing.
11. The Gas-driven Pump Unit shall be located such that the ambient temperature conditions around the unit shall be in the range from 40°F to 130°F.
12. Only ceiling mounted nozzle (Model 4S 1MC 8MC 1000 and Model 4S 1MC 8MB 1000) and other system components listed in the Factory Mutual Approval Report (Project ID 3026250) Class 5560 dated November 6, 2006 shall be used in the system.
13. The system shall be used in manned or monitored facilities only.
14. The use of FM approved detection devices and FM approved control panels is required.
15. Installation, testing and maintenance shall be conducted by a licensed master fire suppression piping contractor – Class 'A' or Class 'B' licensee.
16. High-pressure piping shall be clearly identified by means of labeling.
17. Installation shall comply with all applicable New York City codes, rules, regulations and testing requirements.
18. The system shall be installed with manual discharge capabilities.
19. Cylinders shall be located outside of the equipment enclosure protected.
20. Automatic or manual activation of the system shall sound a local alarm, transmit an alarm to an approved central station, automatically close any doors and dampers, and shut down fuel and lubrication supplies as required by NFPA 750.
21. Power to the alarm system shall be in accordance with the applicable requirements of the New York City Building Code, and the New York City Electrical Code.
22. Provisions shall be made for audible and visible alarms within and outside the location to be protected by the installation to signal the activation of an automatic detection device and subsequent operation of extinguishing system. Such signals shall continue until the atmosphere has been returned to normal.
23. Plans filed with the Department of Buildings for the installation, showing detection equipment, equipment and piping alarm systems, and all other safety features, shall be reviewed and approved by the Bureau of Fire Prevention for each location prior to installation.

24. The applicant shall ensure that the installation has been subjected to a satisfactory inspection and test in the presence of an inspector from the Bureau of Fire Prevention prior to placing the system in operation. Such inspection shall demonstrate the following:
- a) All detection, discharge, alarms and other devices operate satisfactorily,
 - b) All piping is clear and unobstructed, and that the piping and attached appurtenances subject to system pressure shall be hydrostatically tested to 150 percent of the normal working pressure, and shall be maintained at that pressure without loss for two hours. Loss shall be determined by drop in gauge pressure or visible leakage.
 - c) In addition, a discharge test may be required where, in the opinion of the Bureau of Fire Prevention, such a test is needed to be determined by drop in gauge pressure or visible leakage.
25. Water mist system inspection, testing, maintenance activities, and personnel training shall be implemented in accordance with the relevant sections of Section FC 901, FC 904 of the NYC Fire Code and NFPA 750 (2003). The results of inspection, testing, and maintenance conducted during the previous three years shall be maintained on the premises, and shall be produced upon demand by a Fire Department representative.
26. Each approved system shall bear a metal label permanently affixed indicating the MEA approval number issued by the Material and Equipment Acceptance (MEA) Division of the NYC Department of Building.
27. The use of door opening nozzle (4S 1MC 8MC 1000) is required when using compressed air as the atomizing medium in special hazard machinery spaces in enclosures with volumes up to 17,645 cubic feet.
28. The use of door opening nozzles (4S 1MC 8MC 1000 or 4S 1MC 8MB 1000) is required when using compressed air as the atomizing medium for the protection of combustion turbines, machinery spaces, special hazard machinery spaces in enclosures with maximum volume of 26,485 cubic feet.

Final Acceptance August 4, 2008
Examined By Donald [Signature]