

FM-200* Total Flooding Fire Suppression System

General

The FM-200* Total Flooding Fire Suppression System is an engineered system utilizing a fixed nozzle agent distribution network. The system is designed and installed in accordance with the National Fire Protection Association (NFPA) Standard 2001, "Clean Agent Fire Extinguishing Systems." When properly designed, the FM-200 system can suppress a surface burning fire in Class A, B, and C hazards.

The fire fighting ability of the FM-200 system is achieved through 80% heat absorption and 20% direct chemical means (action of the fluorine radical on the chain reaction of a flame). Fire suppression using the FM-200 system has the following advantages:

- Most effective when used with automatic detection to rapidly introduce FM-200 fire extinguishant agent
- The ability to prevent re-ignition when concentration levels are maintained
- Clean agent suitable for protection of high value assets

Typical areas for FM-200 system protection:

- | | |
|----------------------------|-------------------------------|
| ■ Bank vaults | ■ Libraries |
| ■ Rare book stores | ■ Electronic data processing |
| ■ Telephone exchanges | ■ Studios |
| ■ Communication centers | ■ Transformer and switchrooms |
| ■ Control rooms | ■ Test laboratories |
| ■ Flammable liquid storage | |

System Operation

The basic system consists of suppressing agent stored in high strength steel containers. Manual or automatic actuators are available for release of the agent into the hazard area. The agent is distributed and discharged through fixed piping and nozzles. Each nozzle is designed to deliver a uniform discharge of agent into the protected area. On large hazards, containers can be manifolded together. The containers are connected to the manifold by means of a flexible discharge bend and check valve.

Automatic actuation is accomplished through an approved detection system. When a fire condition causes the detector(s) located in the hazard area to go into alarm, a signal is sent to the detection control panel. This causes actuation of the release circuit, which electrically operates the actuator located on the container valve. The actuator opens the valve and allows the agent to enter the piping network and discharge out the nozzles.



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Listings and Approvals

FM-200 Fire Extinguishant Agent

- Factory Mutual (FM)
- Underwriters Laboratories (UL)
- NFPA 2001 "Clean Agent Fire Extinguishing Systems"
- EPA SNAP
- Australian Industrial Chemicals Notification
- German Institute for Environmental Hygiene and Medicine

FM-200 Fire Suppression System

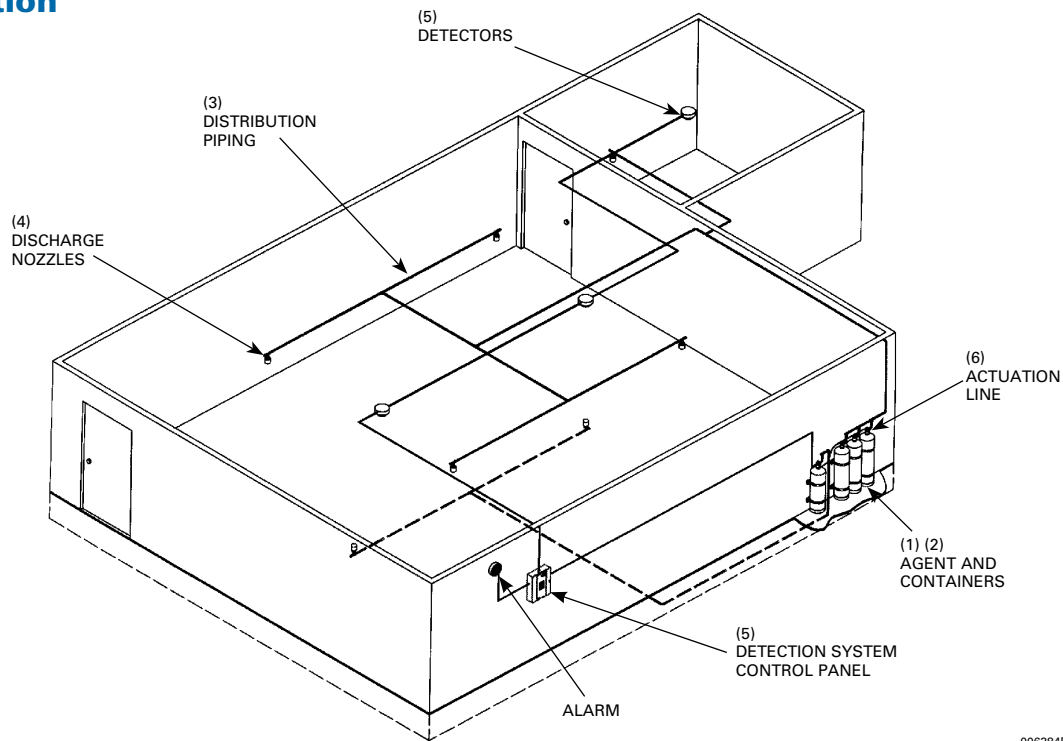
- Underwriters Laboratories (UL)
- Factory Mutual (FM)

Note: English and Metric conversions are rounded as appropriate to stay within maximum and minimum approved values.

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* FM-200 is a trademark of Chemours Chemical Corporation.

Typical Installation



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1. **Agent Container** – The agent storage container consists of an approved DOT 4BW450 or DOT 4BW500 high pressure steel container fitted with a valve and internal siphon tube, factory filled with FM-200 fire extinguishant which is super-pressurized with dry nitrogen to 360 psi at 70 °F (25 bar at 21 °C).
 - Containers sharing the same manifold shall be equal in size and fill density.
 - Containers are available in 8 sizes, ranging from 2.1 gal (8 L) to 90.6 gal (343 L).
 - Nameplate displays the agent weight, tare weight, gross weight, fill density, and charge date.
 - For larger size containers, an optional liquid level indicator is available (standard on 90.6 gal (343 L) containers).
2. **Agent** – FM-200 agent (HFC-227ea) is a clean, gaseous agent containing no particles or oily residues. It is produced under ISO 9000 and approved to ISO 9001 guidelines to strict manufacturing specifications ensuring product purity.
 - FM-200 agent leaves no residue or oily deposits on delicate electronic equipment, and can be removed from the protected space by ventilation.
 - FM-200 agent is thermally and chemically stable, but without the extremely long atmospheric lifetimes associated with other proposed halon replacements. The atmospheric lifetime has been determined to be 36.5 years. The EPA does not consider FM-200 agent to be a long-lived substance when discharged, and as such, has placed no restrictions on its use.
3. **Distribution Piping Network** – FM-200 engineered systems are based on the ANSUL® FM-200 System Flow Calculation Program. The program calculates the two-phase flow of the agent and nitrogen through a pipe network. Information detailing the enclosure is entered and the program calculates the required pipe sizes, nozzle drill sizes, average nozzle pressures, and discharge time. As system design calculations are critical to the success of the suppressing system, only Tyco Fire Protection Products or Tyco trained personnel are permitted to perform system calculations using the ANSUL FM-200 System Flow Calculation Program.
4. **Nozzles** – FM-200 agent is distributed within the protected area through the discharge nozzle, which is sized to ensure the correct flow of agent for the hazard.
 - Nozzles are available with seven or eight ports to allow for 180° or 360° horizontal discharge patterns.
 - Ports are drilled in 0.1 mm increments to the specified system design.
 - Nozzles are supplied in brass or stainless steel with NPT threads.
 - Nozzles are available in 7 sizes, ranging from 3/8 in. (10 mm) to 2 in. (50 mm).
5. **Detection System** – The AUTOPULSE Detection System is UL Listed and FM Approved for the FM-200 fire suppression system when an automatic electronic detection system is required.
 - This fire alarm control panel (FACP) is used to actuate a single tank or multi-tank FM-200 fire suppression system from the fire detection devices connected to the FACP.
 - The FACP can be programmed to release with either a single detector in alarm or with cross detection.
 - This detection system is used to actuate a single, fixed, fire suppression or alarm system based on inputs received from fire detection devices.
 - The detection circuits can be configured using cross, counting, independent or priority-zone (counting) concepts.
 - The detection system has been tested to the applicable FCC Rules and Regulations for Class A Computing devices.
6. **Actuation Line** – The “Master” container is actuated via the detection release circuit. To actuate “Slave” containers, 1/4 in. flexible, stainless steel actuation hose is used. The hose is connected to the pressure port of the master container valve. From that location, run the hose to pneumatic actuators located on top of each of the slave container valves. The pressure channeled from the master port operates the pneumatic actuators on the slave valves, causing them to open.