

## Fixed Extinguishing Systems

### **Description:**

Automatic sprinkler systems installed in workplaces but not required to meet an OSHA standard are exempt from the OSHA standard. Automatic sprinkler systems installed to meet an OSHA standard that comply with National Fire Protection Association (NFPA) or the National Board of Fire Underwriters (NBFU) standard in effect at the time of the system's installation will be acceptable as compliance with the standard. Fixed extinguishing systems shall be designed and approved for use on the specific fire hazards they are expected to control or extinguish. Fire detection systems, automatic sprinkler systems, and fixed extinguishing systems must be maintained and periodically tested to ensure that they are in operable condition.

### **Regulatory Reference**

29 CFR §1910.159	Automatic sprinkler systems.
29 CFR §1910.160	Fixed extinguishing systems, general
29 CFR §1910.163	Fixed extinguishing systems, water spray and foam.
29 CFR §1910.164	Fire detection systems

### **Applies to:**

The standards apply to operations at bulk plants, buildings or other structures where fire detection systems, automatic sprinkler systems or fixed extinguishing systems are installed, including water deluge and monitor gun installations.

### **General Requirements:**

#### **Fire Detection Systems**

1. The standard applies to all automatic fire detection systems installed to meet the requirements of a particular OSHA standard.
2. The employer shall assure that all devices and equipment constructed and installed to comply with this standard are approved for the purpose for which they are intended.
3. The employer shall restore all fire detection systems and components to normal operating condition as promptly as possible after each test or alarm. Spare detection devices and components which are normally destroyed in the process of detecting fires shall be available on the premises or from a local supplier in sufficient quantities and locations for prompt restoration of the system.
4. The employer shall maintain all systems in an operable condition except during repairs or maintenance.
5. The employer shall assure that fire detectors and fire detection systems are tested and adjusted as often as needed to maintain proper reliability and operating condition except that factory calibrated detectors need not be adjusted after installation.
6. The employer shall assure that the servicing, maintenance and testing of fire detection systems, including cleaning and necessary sensitivity adjustments are performed by a trained person knowledgeable in the operations and functions of the system.

7. The employer shall assure that fire detection equipment installed outdoors or in the presence of corrosive atmospheres be protected from corrosion. The employer shall provide a canopy, hood, or other suitable protection for detection equipment requiring protection from the weather. The employer shall assure that detectors are supported independently of their attachment to wires or tubing, and that detection equipment is protected from mechanical or physical impact that might render it inoperable.
8. The employer shall assure that fire detection systems installed for the purpose of actuating fire extinguishment or suppression systems shall be designed to operate in time to control or extinguish a fire. The employer shall assure that fire detection systems installed for the purpose of employee alarm and evacuation be designed and installed to provide a warning for emergency action and safe escape of employees.
9. The employer shall assure that the number, spacing and location of fire detectors is based upon design data obtained from field experience, or tests, engineering surveys, the manufacturer's recommendations, or a recognized testing laboratory listing.

### Automatic Sprinkler Systems

1. For automatic sprinkler systems used to meet OSHA requirements and installed prior to the effective date of this standard, compliance with the National Fire Protection Association (NFPA) or the National Board of Fire Underwriters (NBFU) standard in effect at the time of the system's installation will be acceptable as compliance with the OSHA standard.
2. Automatic sprinkler systems installed in workplaces, but not required by OSHA, are exempt from the requirements of the OSHA standard.
3. All automatic sprinkler designs used to comply with this standard shall provide the necessary discharge patterns, densities, and water flow characteristics for complete coverage in a particular workplace or zoned subdivision of the workplace.
4. The employer shall properly maintain an automatic sprinkler system installed to comply with the OSHA standard. The employer shall assure that a main drain flow test is performed on each system annually. The inspector's test valve shall be opened at least every two years to assure that the sprinkler system operates properly.
5. *Acceptance tests.* The employer shall conduct proper acceptance tests on sprinkler systems installed for employee protection after January 1, 1981, and record the dates of such tests. Proper acceptance tests include the following:
  - (a) Flushing of underground connections;
  - (b) Hydrostatic tests of piping in system;
  - (c) Air tests in dry-pipe systems;
  - (d) Dry-pipe valve operation; and
  - (e) Test of drainage facilities.
6. *Water supplies.* The employer shall assure that every automatic sprinkler system is provided with at least one automatic water supply capable of providing design water flow for at least 30 minutes. An auxiliary water supply or equivalent protection shall be provided when the automatic water supply is out of service, except for systems of 20 or fewer sprinklers.
7. *Protection of piping.* The employer shall assure that automatic sprinkler system piping is protected against freezing and exterior surface corrosion.

8. *Drainage.* The employer shall assure that all dry sprinkler pipes and fittings are installed so that the system may be totally drained.
9. The employer shall assure that sprinklers are protected from mechanical damage.
10. *Sprinkler alarms.* On all sprinkler systems having more than twenty (20) sprinklers, the employer shall assure that a local waterflow alarm is provided which sounds an audible signal on the premises upon water flow through the system equal to the flow from a single sprinkler.

#### Fixed Extinguishing Systems

1. The standard applies to all fixed extinguishing systems, using water or foam solution as the extinguishing agent, installed to meet a particular OSHA standard.
2. The employer shall assure that foam and water spray systems are designed to be effective in at least controlling fire in the protected area or on protected equipment.
3. The employer shall assure that drainage of water spray systems is directed away from areas where employees are working and that no emergency egress is permitted through the drainage path.
4. Automatic detection equipment shall be approved, installed and maintained in accordance with 29 CFR §1910.164.
5. The employer shall assure that all systems designed for and installed in areas with climatic extremes shall operate effectively at the expected extreme temperatures.
6. The employer shall assure that at least one manual station is provided for discharge activation of each fixed extinguishing system.
7. The employer shall assure that manual operating devices are identified as to the hazard against which they will provide protection.
8. The employer shall train employees designated to inspect, maintain, operate, or repair fixed extinguishing systems and annually review their training to keep them up-to-date in the functions they are to perform.
9. The employer shall assure that fixed systems are inspected annually by a person knowledgeable in the design and function of the system to assure that the system is maintained in good operating condition

#### Training Requirements:

There are no specific employee training requirements for these standards except for employees who may be designated to inspect, maintain, operate or repair fixed extinguishing systems, and their training must be done annually.

Related training that should include any fire detection or extinguishing systems is employee training for emergency action plan and fire prevention plan purposes.

## **Maintenance and Review**

For installations that have fire detection or extinguishing systems, periodic inspection and maintenance operations should be scheduled on a company compliance calendar. Documentation of the following records should be retained and periodically reviewed:

- any employee training,
- system acceptance tests, and
- on-going inspections and tests

### *Additional Information and Resources*

*NFPA 13: Installation of Sprinkler Systems*, National Fire Protection Association, Quincy, MA,  
Internet address [www.nfpa.org](http://www.nfpa.org)

*NFPA 13: Automatic Sprinkler System Handbook*, National Fire Protection Association, Quincy, MA

*NFPA 15: Standard for Water Spray Fixed Systems for Fire Protection*, National Fire Protection Association, Quincy, MA

*NFPA 25: Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, National Fire Protection Association, Quincy, MA

*NFPA 58: The Liquefied Petroleum Gas Code*, National Fire Protection Association, Quincy, MA