# Construction and General Industry Fire Safety

April 16, 2025

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**MIOSHA CET**


Protecting the safety and health of Michigan workers for 50 years.

## MIOSHA Mission

Help Protect the Health and Safety of Michigan Workers!

## MIOSHA Motto

Educate Before We Regulate!


Protecting the safety and health of Michigan workers for 50 years.

# What is MIOSHA CET?

-Provides consultation and training to Michigan Employers

-Offerings include class instruction, training, and on-site hazard surveys

-Provides expertise in Occupational Safety Regulations in construction, general industry, and health

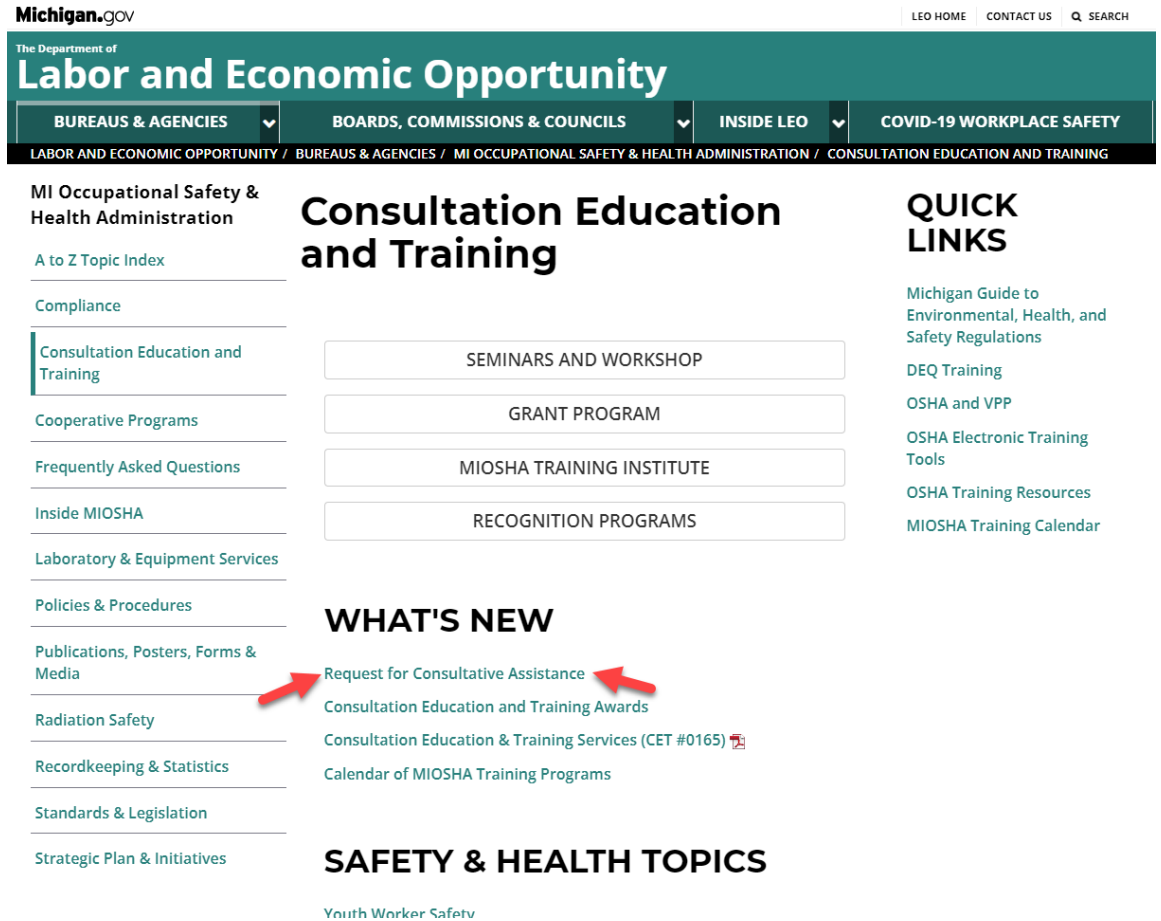
-CET is NOT enforcement; we do not issue citations!


# How can you get CET services?

-Request consultative assistance through the MIOSHA website

-Contact the MIOSHA offices at 517-284-7720

-Reach out to your local consultant directly



# Why Part 18

-MIOSHA shall ensure that employees are presented with a safe working environment.

- From 2016 to 2020, local fire departments responded to an estimated average of 4,300 fires in structures under construction.

- An average of 4 deaths per year on buildings under construction from fire or explosions and 49 injuries.

**NFPA averages*

## Fire Protection Plan

-Employers are required to have a Fire Protection Plan

-Employers must provide necessary equipment to protect employees

- At a minimum, your fire prevention plan must include: A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard.

# Benefits of Developing a Fire Protection and Prevention Plan

- Based on identifying and recognition of fire hazards
- Helps employers inform employees of evacuation signals, routes and community resources available
- Clearly communicates responsibilities to employees in a consistent manner
- A resource for employees to understand how they can be protected
- An excellent tool for onboarding and training workers
- Fewer hurt workers, consistent productivity, and lower insurance rates

# All employers must have a Fire Protection Plan then… right?

- Correct! Make the plan part of the Accident Prevention Plan, which lack there of is one of the most cited violations
- 2020 saw 414 citations issued; 2019 there were 453
- Employers are not only missing the benefits of a well-developed FPP, they are wasting money on paying citations
- Most common barriers to creating an FPP: not aware of the requirements and a lack of understanding of the content required

# R 408.41841 Employer responsibilities; Rule 1841

(1) An employer shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and the employer shall provide the firefighting equipment as specified in these rules. As fire hazards occur, there shall be no delay in providing the necessary equipment.

(2) The fire protection portion of the program shall include all of the following:

(a) Establishing and maintaining a means of egress from all areas of the building occupied by employees to provide free and unobstructed egress from all parts of the building or structure at all times when the building or structure is occupied. A lock or fastening that prevents free escape from the inside of any building shall not be installed, except in mental, penal, or corrective institutions where supervisory personnel is continually on duty and effective provisions are made to remove occupants in case of fire or other emergency.

(b) Posting fire rules or, by other means, informing the employees of the evacuation signal, escape routes, and emergency phone numbers. Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or way to reach the exit is not immediately visible to the occupants.

(c) A requirement that means of egress shall be continually maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

(3) The fire prevention portion of the program shall include both of the following:

(a) A housekeeping policy designed to keep a means of egress free from the accumulation of stored materials and debris and to reduce the likelihood of fire.

(b) A policy for the storage of combustible and flammable liquids and materials and for the use of proper heating equipment as prescribed in this part.

## Portable Fire extinguisher type and location

A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least 1 fire extinguisher shall be located adjacent to stairway.

| CLASS OF FIRE | TYPE OF FIRE | APPROVED FIRE EXTINGUISHER |
|---|---|---|
|  A Ordinary Combustibles | Wood, paper, cloth | Type A; Type A-B |
|  B Flammable Liquids | Gasoline, paints, oils, grease | Type A-B; Type B-C; Type A-B-C |
|  C Live Electrical Equipment | Electrical wiring, fuse box | Type B-C; Type A-B-C |
|  D Combustible Metal | Metals | Bucket of Sand |
|  K Commercial Cooking Equipment | Commercial cooking oil appliances | *Wet Chemical |

# Portable Fire extinguisher type and location

-Not less than 1 portable fire extinguisher that has a rating of not less than 20 BC units shall be located as follows:
-Outside of, but not more than 10 feet from, a door opening to a room used for the storage of more than 60 gallons of flammable liquids.
-Not less than 25 feet, nor more than 75 feet, from an outside storage area.
-On each tank truck or other vehicle used to transport or dispense flammable liquids.
-A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.
-Each service or fueling area shall have at least 1 portable fire extinguisher which has not less than a 20 BC unit rating and which is located within 75 feet of each pump, dispenser, underground fill opening, and lubricating or service area.

## Portable Fire extinguisher Inspection

R 408.41852 Portable fire extinguishers.
Rule 1852. Portable fire extinguishers shall be inspected periodically and maintained in accordance with NFPA 10A “Maintenance and Use of Portable Fire Extinguishers,” 1970 edition, as adopted by reference in R 408.41802.

*NFPA 10 requires extinguishers be inspected when they are initially installed and once a month after that. You should inspect extinguishers more frequently if they are installed in locations where they are more prone to rust, impact or tampering.

# Substitutions to Fire extinguishers

(5) One 55-gallon open drum of water and 2 fire pails may be substituted for a fire extinguisher that has a 2A rating. Extinguishers and water drums, subject to freezing, shall be protected from freezing.

(6) A 1/2 inch or larger interior diameter garden hose that is not more than 100 feet in length and that is equipped with a nozzle may be substituted for a 2A fire extinguisher if it is capable of reaching all points in the area that would be covered by the replaced extinguisher and is capable of discharging not less than 5 gallons per minute with a horizontal hose stream of not less than 30 feet. The hose line shall be mounted on a rack or reel. Not more than 1/2 of the total number of required fire extinguishers may be replaced by the hose.


## What is Fixed Fire Equipment

- Sprinkler System R 408.41853
- Standpipes R 408.41853(b)
- FDC R 408.41855(2)
- Fire Alarms R 408.41856

An alarm system shall be established whereby all employees on the site can be alerted for an emergency. The signaling device shall be audible throughout the structure.


# R 408.41853 Fixed Fire Equipment

(1) Sprinkler protection shall be as follows:

(a) If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.

(b) In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections (FDC) on the outside of the structure, at the street level, which shall be conspicuously marked.

(2) Demolition...

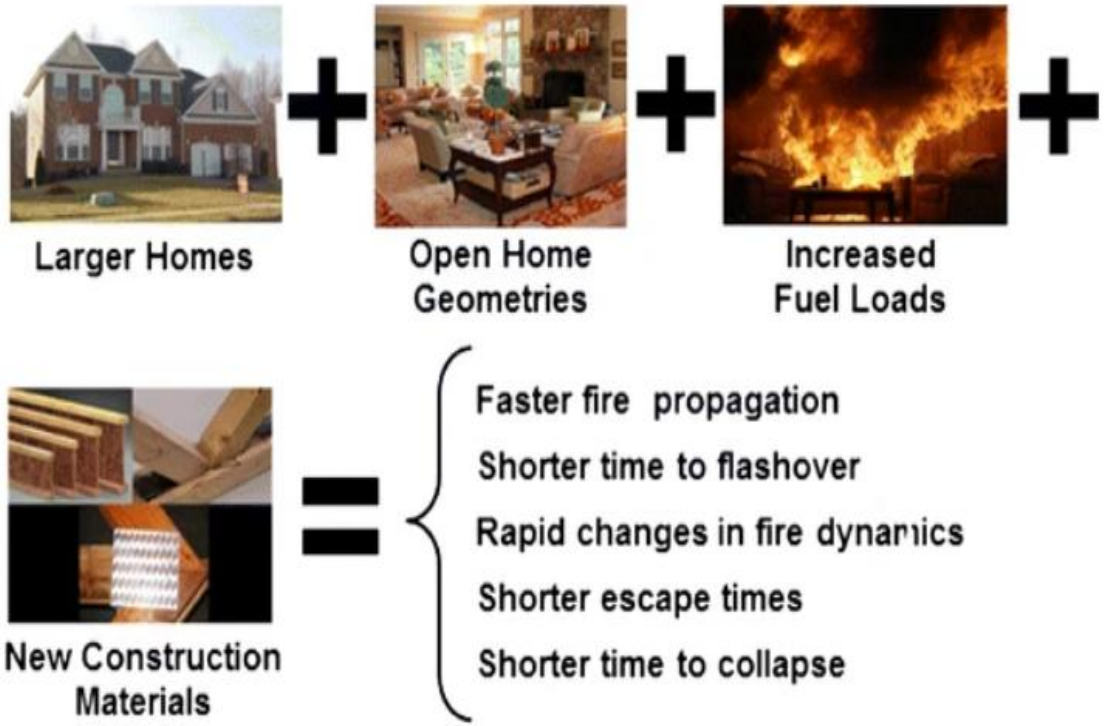
(3) A standpipe and hose system shall have not less than 1 outlet per story.

(4) An automatic sprinkler system shall be installed and maintained as prescribed in The National Fire Protection Association Standards NFPA 13 "Installation of Sprinkler Systems," 1991 edition; NFPA 14 "Standard For The Installation Of Standpipe, Private Hydrants And Hose Systems," 2000 edition; and NFPA 25 "Inspection, Testing, And Maintenance Of Water-Based Fire Protection Systems," 1998 edition. The standards are adopted by reference in R 408.41802

# Sprinkler Systems in Residential Construction

It’s an indisputable fact: residential fire sprinklers save lives and property. National Fire Protection Association (NFPA) model codes and the International Residential Code (IRC) mandate fire sprinklers in all new one- and two-family homes. But concerns about the expense stop many states and communities from implementing the requirement.

The average expense to install sprinkler systems in new homes is about $1.35 per square foot. With the average construction cost of a single-family home at $114 per square foot in 2019, that’s paying a little more than 1% of a home’s value for 24/7 fire protection. When the expense is spread over a 30-year mortgage, it’s less than the price of a cup of coffee per week



# What Prevention is required?

- Ignition Hazards R 408.41861
    - Location of Containers
    - Temporary Buildings
    - Open Yard Storage
    - Indoor Storage
- Flammable Liquids R 408.41862
    - Transportation of Flammable liquids
- Inside Storage R 408.41863
- Inside Storage Room R 408.41864
- Outside Storage R 408.41865
- Portable Tanks and Emergency Venting R 408.41866
- Dispensing R 408.41867
- Handling at Point of Use R 408.41868
- Service and Refueling Areas R 408.41869

# Ignition Hazards

(1) Internal combustion engine powered equipment shall be so located that the exhaust piping is at a distance away from flammable and combustible materials to prevent ignition. When the exhaust is piped to outside the building under construction, a clearance of not less than 6 inches shall be maintained between the piping and flammable and combustible material.

(2) Smoking shall be prohibited within 25 feet of flammable material. The area shall be posted with a sign "No Smoking or Open Flame." The sign shall be as prescribed in the Construction Safety Standard Part 22 “Signals, Signs, Tags and Barricades,” as referenced in R 408.41802.

(3) Electrical wiring equipment and portable battery-powered lighting equipment used in connection with the storage, handling, or use of flammable material shall be of the type approved for the hazardous location.

(4) The nozzle of an air, inert gas, and steam line or hose, when used in the cleaning or ventilation of tanks and vessels that contain flammable gases or vapors, shall be bonded to the tank or vessel shell.

(5) When a hazardous concentration of flammable gas or vapor exists in the area outside of the tank or vessel, the external bonding connection shall be made to the tank or vessel with the non-sparking device. The final bonding connection shall be made outside the hazardous concentration.

# Location of Containers

(1) Containers shall be in a suitable ventilated enclosure or otherwise protected against tampering.

(2) The quantity of flammable liquids kept in the vicinity of spraying operations shall be the minimum required for operations and should ordinarily not exceed a supply for 1 day or 1 shift.

(3) Bulk storage of portable containers of flammable liquids shall be in a separate, constructed building detached from other important buildings or cut off in a standard manner.

(4) Containers shall be upright upon firm foundations or otherwise firmly secured.

(5) The possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(6) LP-gas containers with a water capacity per container of more than 125 gallons shall be located a minimum of 10 feet from the nearest building or group of buildings when in use.

# Temporary Buildings

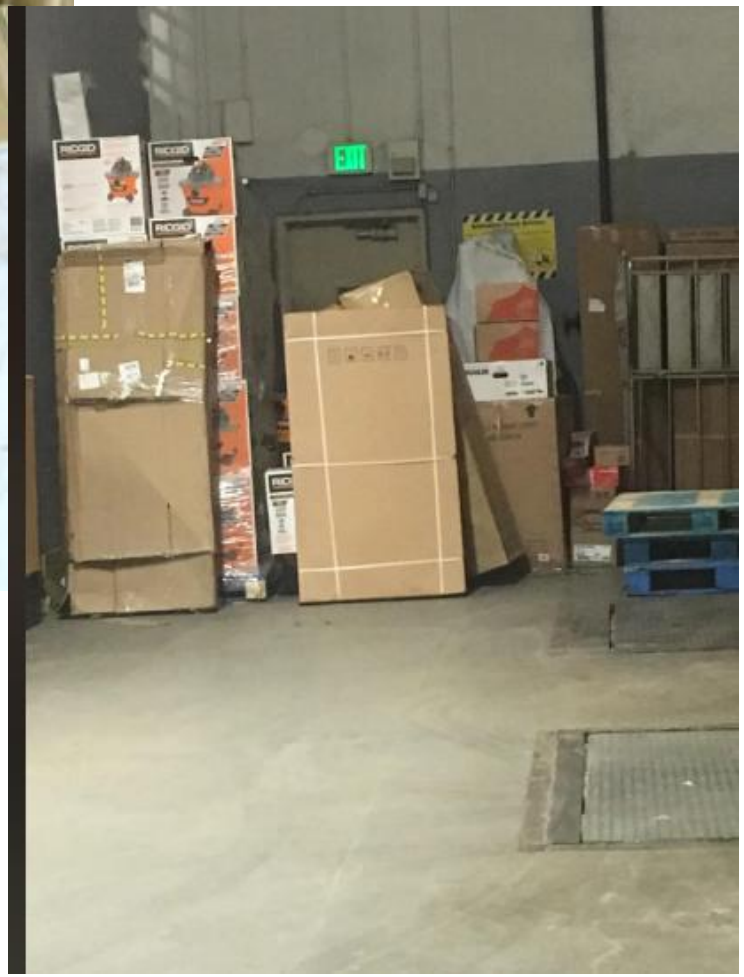
(1) A temporary building shall not be erected where it will adversely affect a means of egress.
(2) Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.
(3) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure.
(4) Groups of temporary buildings not exceeding 2,000 square feet in aggregate, shall, for the purposes of these rules, be considered a single temporary building.

# Open Yard Storage

(1) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.
(2) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials.
(3) Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.
(4) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.
(5) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.
(6) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.
(7) Portable fire extinguishing equipment suitable for the fire hazard involved shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers rated not less than 2A shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

# Indoor Storage

(1) Storage shall not obstruct, or adversely affect, means of exit.
(2) All materials shall be stored, handled, and piled with due regard to their fire characteristics.
(3) Noncompatible materials that may create a fire hazard shall be segregated by a barrier having a fire resistance of at least 1 hour.
(4) Material shall be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for firefighting purposes.
(5) Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.
(6) Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.
(7) A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided in which case no clearance is needed.
(8) Material shall not be stored within 36 inches of a fire door opening.



# Flammable Liquids

(1) Only approved containers and portable tanks shall be used for storage and handling of flammable liquids.

(2) Approved safety cans or department of transportation approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less, except that this does not apply to those flammable liquid materials that are highly viscid (extremely hard to pour), which may be used and handled in original shipping containers.

(3) For quantities of 1 gallon or less, the original container may be used for storage, use, and handling of flammable liquids.



# Indoor Storage

Not more than 25 gallons of flammable liquid shall be stored within a room outside of an approved wood or metal cabinet. For storage of liquefied petroleum gas, see R 408.41877.

A cabinet used to store flammable liquids shall be labeled with conspicuous lettering,
"Flammable Keep Away from Open Flames"
as prescribed in the Construction Safety Standard Part 22 “Signals, Signs, Tags and Barricades,” as referenced in R 408.41802

An inside storage room shall be constructed to meet the required fire resistance rating for its use. The construction shall meet the test specifications in The National Fire Protection Association Standard NFPA 251 "Standard Methods of Fire Testing of Building Construction and Materials," 1990 edition, which is adopted by reference in R 408.41802.

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# Outdoor Storage

(1) Containers of flammable liquids with not more than 60 gallons in each container shall not be stored in excess of 1,100 gallons in any outside storage area.
(2) Portable tanks stored outside shall not be closer than 20 feet from any building. Two or more portable tanks, grouped together, having a combined capacity in excess of 2,200 gallons, shall be separated by a 5-foot clear area. Individual portable tanks exceeding 1,100 gallons shall be separated by a 5-foot clear area. Piles or groups of containers shall be separated by a 5-foot clearance.
(3) Within 200 feet of each portable tank, there shall be a 12-foot wide access way to permit approach of fire control apparatus.
(4) A flammable liquid in an outdoor storage area shall be stored not less than 20 feet from a building.
(9) A flammable or combustible liquid outdoor storage area shall not occupy any area used as a means of egress.

# Outdoor Storage Dispensing

(1) An area where a flammable liquid is transferred at 1 time, in a quantity of more than 5 gallons from 1 tank or container to another tank or container, shall be separate from other operations or a building by a distance of 25 feet or by a wall not less than 5 feet high having a fire resistance of not less than 1 hour.
(2) Provisions shall be made to neutralize spills of flammable liquids. Natural or mechanical ventilation shall be capable of maintaining vapor below 10% of the lower explosive limit.
(3) Transfer of a category 1, 2, or 3 flammable liquid from 1 container to another shall be done only when the containers are electrically bonded.
(4) A flammable liquid shall be transferred from or drawn into containers by 1 of the following:
(a) Through a closed piping system.
(b) From a safety can.
(c) By a device drawing through the top from a closed container or portable tank, by gravity or a pump, through a self-closing valve. Air pressure shall not be used.
(5) A dispensing device, hose, and nozzle for category 1, 2, or 3 flammable liquids shall be an approved type.
(6) The dispensing units shall be protected from collision damage.

## Refueling Areas

(1) A tank truck shall be designed, constructed, and maintained as prescribed in The National Fire Protection Association Standard NFPA 385 "Standard For Tank Vehicles For Flammable and Combustible Liquids," 1990 edition, which is adopted by reference in R 408.41802.
(2) The dispensing hose shall be an approved type.
(3) The dispensing nozzle shall be an approved automatic-closing type without a latch-open device.
(4) An emergency switch that is clearly identified and accessible shall be available to shut off all power to all dispensing devices in an emergency and shall be in a location that is remote from the dispensing device.
(5) Sources of ignition, such as smoking, open flame, cutting and welding, frictional heat, sparks, and heating equipment, shall not be permitted within 25 feet in any direction of where an internal combustion engine is fueled or where a flammable liquid is dispensed.
(6) A warning sign prohibiting smoking shall be posted as prescribed in Construction Safety Standard Part 22 “Signals, Signs, Tags, and Barricades,” as referenced in R 408.41802.

# Liquefied Petroleum Gas

(1) Every container and every vaporizer shall be provided with 1 or more approved safety relief valves or devices. These valves shall be arranged to afford free vent to the outer air with discharge not less than 5 feet away, horizontally, from any opening into a building which is below such a discharge.

(2) Shutoff valves shall not be installed between the safety relief device and the container, or the equipment or piping to which the safety relief device is connected, except that a shutoff valve may be used where the arrangement of this valve is such that the full required capacity flow through the safety relief device is always afforded.

(3) Container safety relief devices and regulator relief vents shall be located not less than 5 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

## LP Gas Containers and Equipment

**(1) Containers in use shall be in compliance with all of the following provisions:**

(a) Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.
(b) Filling of fuel containers for trucks or motor vehicles from bulk storage containers shall be performed not less than 10 feet from the nearest masonry-walled building, or not less than 25 feet from the nearest building or other construction and, in any event, not less than 25 feet from any building opening.
(c) Filling of portable containers or containers mounted on skids from storage containers shall be performed not less than 50 feet from the nearest building.

## LP Gas Containers and Equipment

Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system. This provision shall not be construed as requiring an automatic changeover device.

Heaters shall be equipped with an approved regulator in the supply line between the fuel cylinder and the heater unit. Cylinder connectors shall be provided with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.

Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls, or otherwise rigidly secured, and shall be so installed or protected from the elements.

All cylinders shall meet the provisions of the Department of Transportation Title 49 C.F.R. Part 178, “Shipping Container Specifications,” as adopted in R 408.41802.


## Storage of LPG Containers

(1) This rule applies to the storage of portable containers whether filled or empty if they have been in service.
(2) Storage of L.P. gas within buildings is prohibited.
(3) Storage outside of buildings, for containers awaiting use, shall be located away from the nearest building or group of buildings as specified in table 4.
(4) Table 4 reads as follows:
(5) Containers shall be stored within a suitable ventilated enclosure or otherwise protected against tampering and located as specified in table 4.
(6) When L.P. gas and 1 or more other gases are stored or used in the same area, the containers shall be marked to identify their content. Marking shall be in compliance with The Compressed Gas Association Standard CGA C7 "Guide To The Preparation Of Precautionary Labeling And Marking Of Compressed Gas Containers," 2000 edition, which is adopted by reference in R 408.41802.

**Table 4**

| Quantity of LP Gas Stored | Distance(feet) from a building |
|---|---|
| 500 lbs. or less | 0 |
| 501 to 6,000 lbs. | 10 |
| 6,001 to 10,000 lbs. | 20 |
| Over 10,000 lbs. | 25 |

# Temporary Heating Devices

(1) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workmen. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.
(2) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workmen, and limit temperature rise in the area.
(3) A temporary heating device shall not be located less than 50 feet from a point where a flammable liquid is used or dispensed.
(4) A temporary heating device that is set on a combustible floor shall be separated from the floor by an insulating material or 1 inch of concrete. The insulating material shall extend not less than 2 feet beyond the heater in all directions.
(5) A temporary heating device shall be located not less than 10 feet from a combustible covering, such as, but not limited to, canvas or tarpaulins, unless the covering is fastened to prevent its dislodgement due to wind action.


## Temporary Heating Devices continued

(6) A temporary heating device using L.P. gas, other than in an integral heater-container unit, shall be located not less than 6 feet from any L.P. gas container.
(7) Integral heaters may be used if designed and installed to prevent direct or radiant heat application to the container.
(8) Blower-and radiant-type units shall not be directed toward any L.P. gas container that is less than 20 feet away.
(9) If 2 or more heater units are located within the same unpartitioned area, then the containers of each unit shall be separated from the containers of any such other unit by not less than 20 feet.
(10) If containers are manifolded together and serve 1 heater on the same floor, then the total water capacity of the containers shall not be more than 735 pounds (nominal 300 pounds L.P. gas capacity). If more than 1 such manifold is used, they shall be separated by not less than 20 feet.


## Temporary Heating Devices continued

(11) Heating devices, including portable heaters and salamanders using a liquid flammable fuel such as, but not limited to, fuel oil or kerosene, shall be equipped with an approved automatic shutoff safety control device which will, in the event of flame failure, shut off the flow of fuel to the main burner and pilot if used. The device shall not be relit while the combustion chamber is hot.
(12) Portable heaters including salamanders shall be equipped with an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in the event of flame failure. Such heaters, having inputs above 50,000 British thermal unit's (B.T.U.) per hour, shall be equipped with either a pilot, that is lighted and proved before the main burner can be turned on, or an electric ignition system.
(13) A temporary heating device shall be installed horizontally level.
(14) A solid fuel salamander shall not be used in a building or on a scaffold.

# Part 18 Summary

1. **Fire Prevention Plans**

Must have one as part of the Accident Prevention Plan. One of the first questions that should be asked when you get onto a construction site.

2. **Employee Emergency Plan**

Do all the employees know what to do if you have a fire? Should be included into the Accident Prevention Plan.

# Part 18 Summary

3. **Fire Fighting Equipment**

Must have for each 3,000 sq/ft of protected building area. Must have one on each floor at least one must be located adjacent to a stairway.

4. **The Storing and Dispensing of Flammable and Combustible Materials**

No smoking with 25’ of Flammable Material., must be posted per Part 22. Stored in ventilated enclosure. No more than 25 gallons of Flammable Liquids stored outside of an approved cabinet.

# Part 18 Summary

5. **Heating Devices for Construction Operations**

Must be 50’ away from flammable liquids are used or stored. 10’ away from combustible coverings. Must be used in a well-ventilated area. Must not be used on a combustible floor, must be on insulated material or concrete.

# Part 18 Questions?

# General Industry or Construction?

Both "construction" and "general industry" workplaces have specific fire safety regulations, with the key difference being that the construction standards often include additional provisions related to the temporary nature of construction sites and potential hazards like open flames and exposed wiring, while general industry standards focus on more established workplaces with potentially different fire risks depending on the industry type; both fall under the same basic principles of proper fire extinguisher placement, clear exit routes, housekeeping practices, and employee fire safety training.

# General Industry Part 6 Fire Exits

GENERAL PROVISIONS
R 408.10601 Scope.
Rule 601. (1) These rules specify requirements for means of egress for employee use required by the advent of hazardous conditions such as fire, explosion, and natural disaster.
(2) These rules apply to workplaces in general industry except mobile workplaces such as vehicles or vessels.
(3) These rules cover the minimum requirements for exit routes that employers must provide in their workplace so that employees may evacuate the workplace safely during an emergency. These rules cover the minimum requirements for emergency action plans and fire prevention plans.

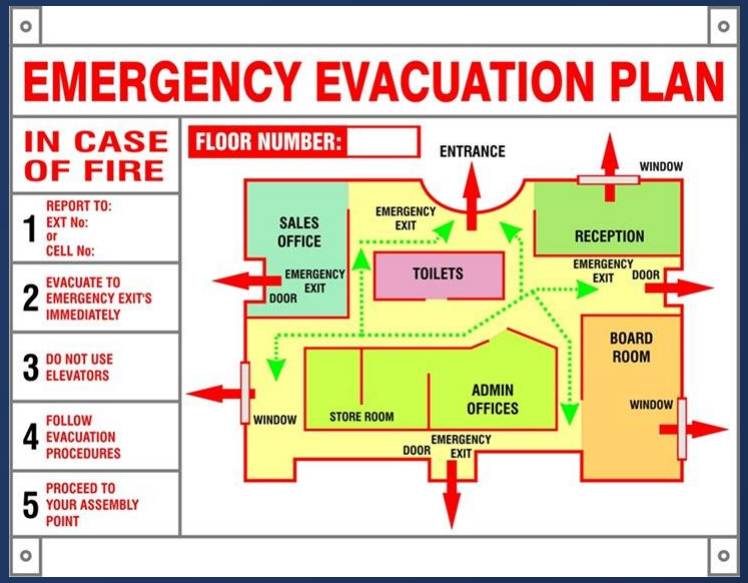
# General Industry Part 6 Fire Exits

Referenced consensus standards include;

- National Fire Protection Association NFPA 101 “Life Safety Code,” 2009 edition
- “International Fire Code” 2009 edition


# General Industry Part 6 Fire Exits

408.10623 Employee emergency plans.
Rule 623. (1) An employer shall have an emergency action plan whenever required by a particular Michigan occupational safety and health act standard. The requirements in these rules apply to each such emergency action plan.
(2) An emergency action plan shall be in writing, kept in the workplace, and available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees



# General Industry Part 6 Fire Exits

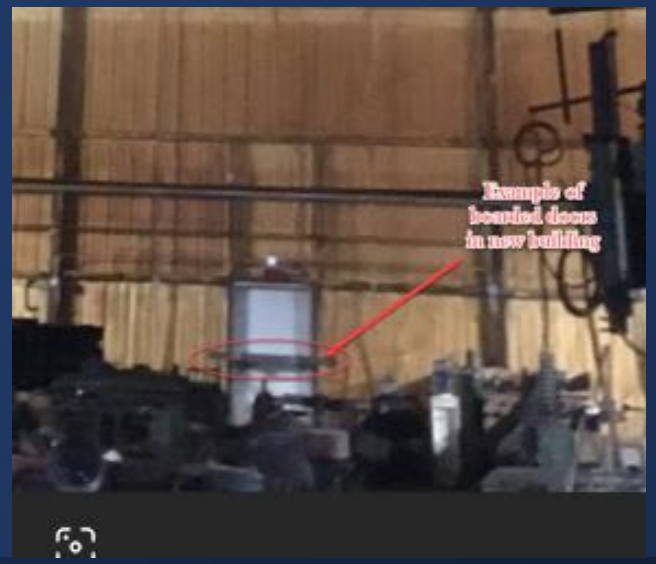
408.10624 Fire prevention plans.
Rule 624. (1) An employer shall have a fire prevention plan whenever they are required by a particular Michigan occupational safety and health act standard. The requirements in these rules apply to each such fire prevention plan.
(2) A fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees.

# General Industry Part 6 Fire Exits

08.10631 Construction, maintenance and changes.
Rule 631.
(1) The components of a means of egress including doors, stairs, ramps, passages, and signs shall be of substantial construction and shall be maintained in an operable condition.
(2) An exit shall be not less than 28 inches (71.1 cm) wide at all points, except where specifically permitted elsewhere in this part. Where there is only 1 exit access leading to an exit or exit discharge, the width of the exit and exit discharge shall be at least equal to the width of the exit access.
(3) The ceiling of an exit route shall be at least 7 feet 6 inches (2.3 m) high. Any projection from the ceiling shall not reach a point less than 6 feet 8 inches (2.0 m) from the floor

# General Industry Part 6 Fire Exits [Commonly cited]

408.10632 Obstructions.
Rule 632. (1) An employer shall ensure that exit routes are free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route. The exit access must not go through a room that can be locked, such as a bathroom, to reach an exit or exit discharge, nor may it lead into a dead-end corridor. Stairs or a ramp must be provided where the exit route is not substantially level.
(2) A lock, fastening device, or barrier must not be installed or used on a means of egress in a manner that will prevent or hinder free escape from the inside of a building.



# General Industry Part 6 Fire Exits

408.10636 Maximum travel distance to exits.

| TABLE 1 | | | |
|---|---|---|---|
| Type of occupancy | Maximum travel distance to exits (in feet) | | Dead-end limits (in feet) |
| | Unsprinklered | Sprinklered | |
| Mercantile, ordinary hazard | 150 | 250 | 50 |
| Mercantile, high hazard | 75 | 75 | 0 |
| Business | 200 | 300 | 50 |
| Industrial | 200 | 250 | 50 |
| Industrial, high hazard | 0 | 75 | 0 |
| Storage, low and ordinary hazard | 200 | 400 | 100 |
| Storage, high hazard | 75 | 100 | 0 |
| Hotels | 100 | 200 | 50 |
| Note: For miscellaneous structures, See R 408.10691 to R 408.10697 | | | |

# General Industry Part 6 Fire Exits

408.10641 Exit access and discharge.

Rule 641.(1) An exit access must not be through a room subject to locking.

(2) An exit access must be so arranged that it will not be necessary to travel through any area of high hazard occupancy to reach the nearest exit.

(3) The minimum width of an exit access must be at least equal to the required width of the exit to which it leads, but not less than 34 inches. The headroom clearance must be not less than 6 feet 8 inches from the floor.

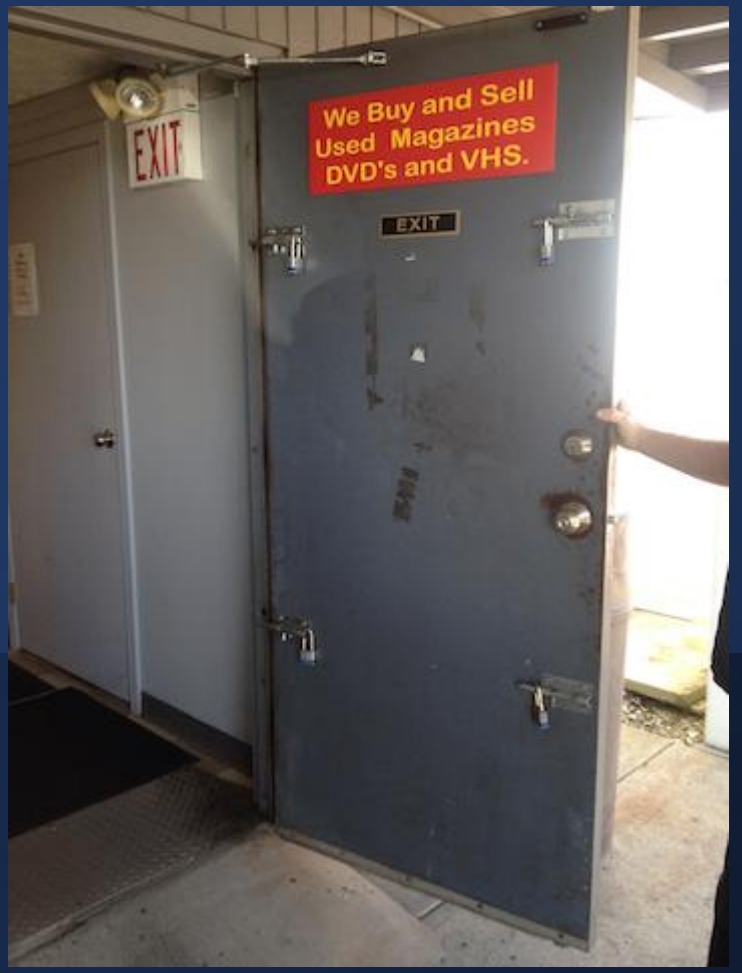
(4) An exit discharge must discharge directly outside or to a street, walkway, refuge area, public way, or to a yard, court, or other open space with access to the outside.

# General Industry Part 6 Fire Exits

408.10645 Locks, fastening devices, and closing mechanisms.

Rule 645. (1) Employees shall be able to open an exit route door from the inside at all times without keys, tools, or special knowledge. A device such as a panic bar that locks only from the outside is permitted on exit discharge doors.

(2) A latch or other fastening device on an exit door shall be provided with a knob, handle, panic bar, or other simple type of releasing device. Slide bolts, hasps, hooks and eyes, and similar types of locking devices that are difficult to open against door pressure shall not be installed or used.



# General Industry Part 6 Fire Exits

ILLUMINATION AND MARKING

R 408.10680 Lighting.

Rule 680. (1) Lighting and marking shall be adequate and appropriate.

(2) Each exit route shall be adequately lighted so that an employee with normal vision can see along the exit route.

R 408.10681 Artificial lighting.

Rule 681. (1) A means of egress shall be illuminated by artificial lighting at places and for periods of time required to maintain the illumination to values not less than 1.0 foot candles measured at the floor. Illumination shall be so arranged that the failure of any single lighting unit, such as the burning out of an electric bulb, will not leave the area in darkness.

(2) Artificial lighting shall be from a source of reasonable reliability, such as a public utility service. A battery operated electric light or any type of portable lamp or lantern shall not be used for primary exit illumination. Luminescent, fluorescent or reflective material shall not be used as a substitute for required illumination.

# General Industry Part 6 Fire Exits

408.10685 Signs.

Rule 685. (1) A means of egress to an exit not immediately apparent from any point in an occupancy shall be marked by directional signs. Additionally, the line-of-sight to an exit sign shall clearly be visible at all times.

(2) A door, passage, or stairway, which is neither an exit nor an exit access, and which is so located or arranged as to be likely mistaken for an exit, shall be identified by a sign reading "NOT AN EXIT" or similar designation, or be identified by a sign indicating its actual use or character.

(3) A sign shall designate an exit and shall be located and be of such size and color and design as to be readily visible and identifiable from the distance of travel for that particular occupancy.

(4) Each exit must be clearly visible and marked by a sign reading "EXIT."

# General Industry Part 8 Fire Extinguishers

408.10801 Scope, application, adoption, and availability of standards.
Rule 801. (1) The rules apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. 29 CFR 1910.157(d) does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. Where extinguishers are provided but are not intended for employee use and the employer has an emergency action plan and a fire prevention plan that meet the requirements of 29 CFR 1910.38 and 29 CFR 1910.39, respectively, then only the requirements of 29 CFR 1910.157(e) and (f) apply. The provisions of this part are the minimum requirements for portable fire extinguishers.

# General Industry Part 8 Fire Extinguishers

A specific rule may be set forth in other general industry safety standards where, due to process hazards, additional portable fire extinguishers may be required.

Exemptions. Where the employer has established and implemented a written fire safety policy which requires the immediate and total evacuation of employees from the workplace upon the sounding of a fire alarm signal and which includes an emergency action plan and a fire prevention plan which meets the requirements of 29 CFR 1910.38 and 29 CFR 1910.39 respectively, and when extinguishers are not available in the workplace, the employer is exempt from all requirements of this section unless a specific General Industry Safety and Health standard requires that a portable fire extinguisher be provided.

# General Industry Part 8 Fire Extinguishers

408.10831 Location.

Rule 831. In a location where a visual obstruction cannot be avoided, a sign, color symbol, or other means shall be used to indicate the extinguisher's location.

R 408.10833 Installation.

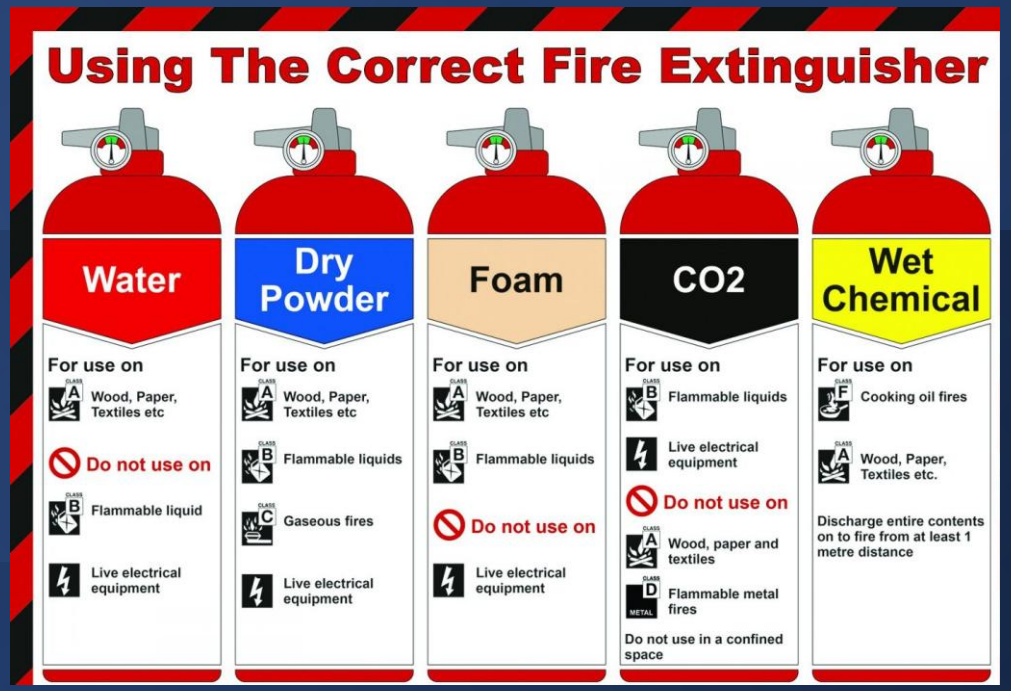
Rule 833. (1) An extinguisher shall be installed securely on a hanger, in a bracket, or mounted in a cabinet unless it is wheeled type or cart mounted. A means shall be used to indicate the location of an extinguisher mounted in a cabinet or on a shelf. The extinguisher shall be placed so that the operating instructions face outward.

# General Industry Part 8 Fire Extinguishers

1910.157(c)(4) The employer shall assure that portable fire extinguishers are maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

# General Industry Part 8 Fire Extinguishers

1910.157(d) Selection and distribution.
1910.157(d)(1) Portable fire extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated workplace fires and on the size and degree of hazard which would affect their use.

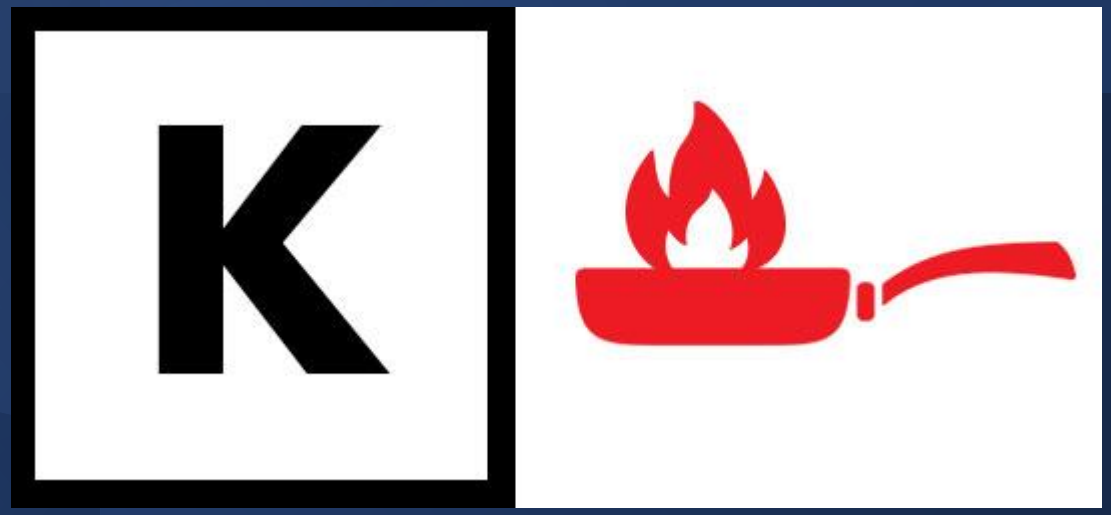


# General Industry Part 8 Fire Extinguishers

1910.157(d)(2) The employer shall distribute portable fire extinguishers for use by employees on Class A fires so that the travel distance for employees to any extinguisher is 75 feet (22.9 m) or less.
1910.157(d)(4) The employer shall distribute portable fire extinguishers for use by employees on Class B fires so that the travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.
1910.157(d)(5) The employer shall distribute portable fire extinguishers used for Class C hazards based on the appropriate pattern for the existing Class A or Class B hazards.
1910.157(d)(6) The employer shall distribute portable fire extinguishers or other containers of Class D extinguishing agent for use by employees so that the travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less. Portable fire extinguishers for Class D hazards are required in those combustible metal working areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

# General Industry Part 8 Fire Extinguishers

R 408.10826 Class "K" extinguishers.
Rule 826. (1) A class “K” extinguisher shall be provided for hazards where there is a potential for fires involving combustible vegetable or animal oils and fats.
(2) A placard shall be conspicuously placed near the extinguisher that states that the fire protection system shall be activated before using the fire extinguisher.
(3) A class "K" extinguisher shall be maintained within 30 feet, 9.15 meters from the hazards.



# General Industry Part 8 Fire Extinguishers

1910.157(e) Inspection, maintenance and testing.
1910.157(e)(1) The employer shall be responsible for the inspection, maintenance and testing of all portable fire extinguishers in the workplace.
1910.157(e)(2) Portable extinguishers or hose used in lieu thereof under paragraph (d)(3) of this section shall be visually inspected monthly.
1910.157(e)(3) The employer shall assure that portable fire extinguishers are subjected to an annual maintenance check. Stored pressure extinguishers do not require an internal examination. The employer shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the Assistant Secretary upon request.

# General Industry Part 8 Fire Extinguishers

1910.157(f) Hydrostatic testing.
1910.157(f)(1) The employer shall assure that hydrostatic testing is performed by trained persons with suitable testing equipment and facilities.

**Table L-1**

| Type of extinguishers | Test interval (years) |
|---|---|
| Soda acid (soldered brass shells) (until 1/1/82) | (1) |
| Soda acid (stainless steel shell) | 5 |
| Cartridge operated water and/or antifreeze | 5 |
| Stored pressure water and/or antifreeze | 5 |
| Wetting agent | 5 |
| Foam (soldered brass shells) (until 1/1/82) | (1) |
| Foam (stainless steel shell) | 5 |
| Aqueous Film Forming foam (AFFF) | 5 |
| Loaded stream | 5 |
| Dry chemical with stainless steel | 5 |
| Carbon dioxide | 5 |
| Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells | 12 |
| Dry chemical, cartridge or cylinder operated, with mild steel shells | 12 |

# General Industry Part 8 Fire Extinguishers

1910.157(g) Training and education.
1910.157(g)(1) Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.
1910.157(g)(2) The employer shall provide the education required in paragraph (g)(1) of this section upon initial employment and at least annually thereafter.
1910.157(g)(3) The employer shall provide employees who have been designated to use fire fighting equipment as part of an emergency action plan with training in the use of the appropriate equipment.
1910.157(g)(4) The employer shall provide the training required in paragraph (g)(3) of this section upon initial assignment to the designated group of employees and at least annually thereafter.

# General Industry Part 9 Fixed Fire Equipment

408.10901. Scope.

Rule 901. This part sets forth general rules which apply to the installation, use, maintenance, and testing of fixed fire extinguishing systems in, around, or about a place of employment as required by provisions of other standards.

# General Industry Part 9 Fixed Fire Equipment

408.10911. Employer's responsibility.
Rule 911. (1) An employer shall be responsible for a maintenance of the fixed fire equipment system in the area occupied or controlled by him.
(2) An employer shall furnish training to an employee before assignment to perform maintenance on a fixed fire equipment system.
(3) An employer shall have the design of the fixed fire equipment system reevaluated whenever the occupancy changes or fire hazards increase.
(4) An employer shall keep a record of the 3 most recent tests and inspections, but in no case shall it cover less than a 12 month period.

# General Industry Part 9 Fixed Fire Equipment

# General Industry Part 9 Fixed Fire Equipment

R 408.10914. Requirements.
Rule 914. (1) A fixed fire equipment system, as listed in R 408.10921 and R 408.10941 to R 408.10976, shall be installed for all of the following: (a) All areas inside a building where flammable liquids are mixed, dispensed or applied, or used for washing or quenching, except either of the following:(i) A dip tank holding less than 150 gallons, having less than 4 square feet of liquid surface or both. (ii) As dispensed from an approved safety container of 5 gallons or less.

**TABLE 1**

| HAZARD | EXTINGUISHER AGENT TYPE AND CONTENTS |
|---|---|
| CLASS A | FIRE FOAM, MULTI-PURPOSE DRY CHEMICAL, HALOGENATED AGENTS, WATER. |
| CLASS B FIRE | CARBON DIOXIDE, DRY CHEMICAL, FOAM, WATER, MULTI-PURPOSE DRY CHEMICAL, HALOGENATED AGENTS SUCH AS HALON 1301. |
| CLASS C FIRE | CARBON DIOXIDE, DRY CHEMICAL, MULTI-PURPOSE DRY CHEMICAL, WATER MIST, HALOGENATED AGENTS. |
| CLASS D FIRE | EXTINGUISHING AGENT LISTED FOR USE ON A SPECIFIC COMBUSTIBLE METAL HAZARD. |

# General Industry Part 9 Fixed Fire Equipment

408.10917. Fire pumps.
Rule 917. (1) A fire pump shall be operated not less than once a month as follows:
(a) A steam fire pump operated until water is discharged freely from the relief valve.
(b) A centrifugal pump operated at rated speed.
(c) If power is provided by an internal combustion engine, the engine shall be run for not less than 30 minutes to bring it up to normal operating temperature.
(d) An automatically controlled pump tested manually shall have not less than 1 start each month accomplished by reducing the pressure in the water pressure sensing line or with a larger flow from the entire system.
(2) A fire pump shall be maintained in a room above freezing temperature.
(3) A fire pump shall be used for fire protection only.
(4) A fire pump shall be tested to rated capacity not less than once a year

# General Industry Part 9 Fixed Fire Equipment

R 408.10923. SPRINKLER SYSTEMS Inspection and maintenance of dry systems.
Rule 923. A dry pipe system shall:
(a) Have the system pressure checked not less than once a week and replenished, when necessary.
(b) Have a means of maintaining the temperature of the dry pipe valve above freezing.
(c) Have all low drain points drained and free of water during freezing temperatures.
(d) Maintain the priming water at the designated level.
(e) Give the dry pipe valve a working test, cleaning and resetting not less than once a year.

# General Industry Part 9 Fixed Fire Equipment

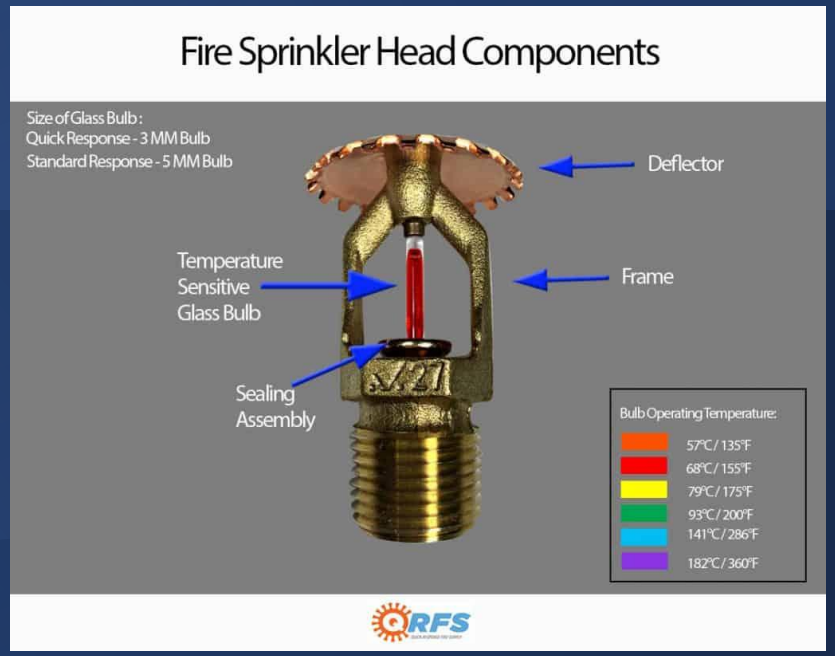
Inspection and maintenance.
Rule 925.
(1) A sprinkler shall not be painted or coated except by the sprinkler manufacturer. Excepted are petroleum jelly or paper bag coverings, which shall not interfere with the normal functioning of the sprinkler.
(2) An automatic sprinkler shall be replaced with a new sprinkler after it is installed 50 years or shows evidence of corrosion, leakage, or damage.
(3) A sprinkler wrench shall be used for installing and removing a sprinkler.
(4) A broken or loose pipe hanger shall be replaced or refastened.
(5) The employer shall perform a main drain flow test on each system annually. The inspectors test valve shall be opened not less than every 2 years to assure the system operates properly.

# General Industry Part 9 Fixed Fire Equipment

Supplies. Rule 926.

(1) A stock of extra sprinklers shall be maintained or readily available for each temperature rating and type so that the system can be returned to readiness as soon as possible.

(2) An automatic sprinkler system of more than 20 sprinklers shall have at least 1 automatic water supply capable of providing design water flow for not less than 30 minutes.



# General Industry Part 9 Fixed Fire Equipment

LOCAL FIRE ALARM SYSTEMS
R 408.10981. Installation and maintenance.
Rule 981.
(1) A local fire alarm system installed or that portion of the system modified after December 31, 1983, shall be installed, modified, and maintained as prescribed in N.F.P.A. standard #72A-1979, standard for the “Installation, Maintenance and Use of Local Protective Signaling Systems for Watchmen, Fire Alarm and Supervisory Service”, as adopted by reference in R 408.10999(j).
(2) Where the protected premises has an emergency power supply, the local fire alarm system shall have a secondary source of power.

# General Industry Part 9 Fixed Fire Equipment

R 408.10983. Location.
Rule 983. (1) A local fire alarm system shall be mounted in a location where the system will not be activated by vibration or jarring.
(2) A manual fire alarm box shall be mounted permanently to a wall or post and protected against physical damage.
(3) A manual fire alarm box shall be located so that the maximum distance on each floor to a box will be not more than 200 feet. The box shall be unobstructed, readily accessible, and in the regular path of travel to an exit. The location of the box shall be identified by a sign or light visible from a distance of not less than 200 feet.

408.10984. Maintenance and inspection.
Rule 984. A local fire alarm system shall be tested by a trained and authorized employee or an outside service not less than once a week to insure operability by the activation of not less than 1 box.

# General Industry Part 9 Fixed Fire Equipment

FIRE DETECTION SYSTEMS

R 408.10991. Installation.

Rule 991. An automatic fire detection system installed or that portion of the system modified after December 31, 1983, shall be installed, modified, and maintained as prescribed in N.F.P.A. standard #72E 1982, “Automatic Fire Detection Systems”, as adopted by reference in R 408.10999(k).

R 408.10993. Location and mounting.

Rule 993. (1) Detectors shall be located or by other means be protected from mechanical or physical impact which could render them inoperable.

(2) Detectors subject to climatic or corrosive atmospheres, or contaminants shall be provided with protection to maintain operability.

(3) Detectors shall be supported independently of their attachment to wires or tubing.

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