

# Fire Prevention

## **References**

SPP #1910.157 Fire Protection

SOP 10-7 Fire safety

OSHA 1910.157 portable Fire Extinguishers



Look around you. Can you identify what types of fires may occur in the area where you are working? How clean is the area where you are working? Is there any chance that the type of work you are doing may start a fire? These are just a few of the questions that you need to keep in mind at work and at home.

## **Housekeeping**

The number one way you can prevent a fire to maintain good housekeeping (keeping the area clean). Putting trash in its proper place will help to reduce the potential for fire. Empty the trash on a daily basis keeping flammable or combustible rags well away from ordinary trash (wood paper limbs & debris.)

## **Don't**

- Pile up combustible materials. Regularly put the materials in bin to be hauled to the landfill.
- Store flammable and combustible materials together where they can be easily ignited. Put materials back in place after you have finished using them.
- Leave areas with trash and debris un-kept. Clean up frequently and stop to clean up if needed.
- Weld or operate cutting equipment or spark producing equipment without a fire extinguisher of the proper type available. Use a welding shield if needed to contain the hot work within a defined area.
- Allow grass/trash & debris to become so high that it creates a fire hazard. As grass and weeds dry out, they become a greater fire hazard. Keep it cut.
- Leave trash inside and outside the facilities. Trash accumulation by others or internal creates a greater risk for fire. Even when it is thrown out from the road.
- In addition to fire, un-kept areas can also harbor rodents, mosquitos.

## The Elements of a Fire

Fire, regardless of the type needs 4 things to occur in order for it to burn. In order for the fire to start, it must have 3 elements; fuel, heat and oxygen. Once all three are present, the 4 element is a chemical reaction that occurs to combine all 3 of the elements. Once combined, a fire can exist.



**Heat -** Heat must be present for the fire to exist. Heat is the energy necessary to increase the temperature of the fuel to a point where sufficient vapors are given off for ignition to occur. The temperature of the heat need only be high enough to meet the combustibility or flammability of the fuel source.

**Oxygen –** Basically, the air that we breathe is about 21 percent oxygen. Fire only needs an atmosphere with at least 16 percent oxygen in order to burn. Less than that and the fire may smolder waiting for a good source of oxygen to ignite.

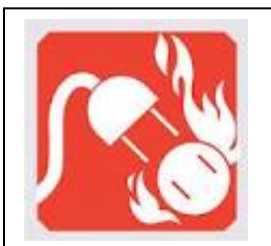
**Fuels -** the types of fuels which are available determine the type or class of fire. Depending upon what sources are available, you may have more than one type of fire in an area. The fuels listed below and their common symbols found on fire extinguishers are listed below.



Class A Fuels - Class A fuels are ordinary wood paper and trash fires. It also includes rubber and some plastics and includes fibrous materials such as limbs and trees from yard waste. Water is the primary extinguishing agent.

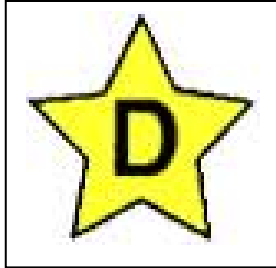


Class B Fuels - Class B fuels are liquid fuels and include flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. Due to the potential for the fires to spread with use of water, the primary extinguishing agent is CO2 or foams that smother or cut the oxygen source off.



Class C Fuels - Class C fuels are electrical in nature. Class C fires happen on energized electrical circuits or wiring. They can occur in electrical equipment, such as appliances, switches, panel boxes and power tools and wiring. As long as the circuit is live, it is a class C fire. The primary extinguishing agent is CO2 since it removes the oxygen and cools the heat down at the same time.





**Class D Fuels** - Class D fuels are metal fires. Certain combustible metals, such as magnesium, titanium, potassium and sodium. These metals burn at high temperatures and give off sufficient oxygen to support combustion. They may react violently with water or other chemicals, and must be handled with care. The usual extinguishing agent for a class D fire is sand or dirt and dry powder agents.



**Class K Fuels** - Class K fires are fires that involve vegetable oils, animal oils, or fats in cooking appliances. This is mainly for commercial kitchens, including those found in restaurants, cafeterias, and caterers but may apply in your house as well. This is a relatively new classification.

## Extinguishing Agents

Fire extinguisher agents vary depending upon the situation that they are needed for. They are usually classed according to the type of fire situation that they will be put into. The three most common extinguishing agents are listed below.

**Dry chemical agents work by** preventing the chemical reaction involving heat, fuel, and oxygen and halt the production of fire sustaining "free-radicals", thus extinguishing the fire. In other words, they break up the fire by separating the elements.

Monoammonium phosphate, also known as "tri-class", "multipurpose" or "ABC" dry chemical, used on class A, B, and C fires. It receives its class A rating from the agent's ability to melt and flow at 177 °C (350 °F) to smother the fire. More corrosive than other dry chemical agents. Pale yellow in color. It is the most common fire extinguishing agent currently used in the division. It will handle most all fires that we will deal with.

**CO<sub>2</sub> extinguishing agents are** a clean gaseous agent which displaces oxygen. Highest rating for 7.7 kg (20 pound) portable CO<sub>2</sub> extinguishers is 10B:C. Not intended for Class A fires, as the high-pressure cloud of gas can scatter burning materials. CO<sub>2</sub> is not suitable for use on fires containing their own oxygen source, metals or cooking media. Although it can be rather successful on a person on fire, its use should be avoided where possible as it can

cause frostbite and is dangerous to use as it may displace the oxygen needed for breathing, causing suffocation. These extinguishers usually have a wide horned nozzle.

**Water** - APW (Air pressurized water) cools burning material by absorbing heat from burning material. Effective on Class A fires, it has the advantage of being inexpensive, harmless, and relatively easy to clean up. In the United States, APW units contain 2.5 gallons (9 liters) of water in a tall, stainless steel cylinder.

## Where are Fire Extinguishers located?

Fire extinguishers should be readily visible and in conspicuous locations. They should be marked and spaced so that they are easy to access when needed. They should also be located next to exits and within no more than:

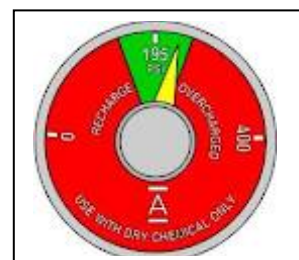
Class of Fire Extinguisher	Maximum distance to
A	Every 75 ft.
B	Every 50 ft.
C	Based on electrical equipment to be protected.
D	Every 75 ft.

Mounted in the building, they should not be used for coat racks or be covered up by other materials. Fire extinguishers should also be located in each vehicle and readily accessible in the event of a fire. Any vehicle or motorized equipment with a fire extinguisher must have a bracket to secure the fire extinguisher and prevent it from rolling around in the cab.

## Inspections

Fire Extinguishers are to be visually inspected monthly to ensure that the charge has been maintained. Each month the inspection tag must be documented to show that the inspection has taken place. The fire extinguisher must also undergo an annual inspection that may include the pressure testing of the canister. The Safety pull pin must be secure on the handle along with the tamper pin. The tamper seal must not be replaced with a zip tie used for electrical wiring. The pull force required to break the zip tie may be more than people can handle in an emergency.

When inspecting the fire extinguisher, look for pitting of the metal, rust and dents or dings that may cause a failure of the body. The charge meter should also be in the green. Have the extinguisher repaired or replaced if it does not meet the above specifications.



Don't fight a fire when:

- You cannot keep your back to the exit or escape route from the fire.
- The fire when it gone beyond your ability to fight it with the extinguisher.
- It is spreading out of control.
- It has the potential to block your exit.
- You doubt your ability to put it out.

If these situations exist, call for help or dial 911. Never put your life in jeopardy to fight a fire.

## USING THE EXTINGUISHER

When you fight the fire, use the PASS method for fighting the fire.

### HOW TO USE A PORTABLE FIRE EXTINGUISHER

Remember the acronym, "P.A.S.S."—

**P** .....Pull the Pin.

**A** .....Aim the extinguisher nozzle at the base of the flames.

**S** .....Squeeze trigger while holding the extinguisher upright.

**S** .....Sweep the extinguisher from side to side, covering the area of the fire with the extinguishing agent.



Test your knowledge

1. Which of the following are the elements of a fire?
  - a. Heat
  - b. Fuel
  - c. Oxygen
  - d. Chemical Reaction
  - e. All the above
2. What happens if you remove any one of the elements of the fire by using a fire extinguisher?
  - a. The fire grows larger
  - b. The fire grows smaller
  - c. The fire goes out
  - d. The fire calls for help

3. Which of the following inspections is required on all fire extinguishers?
  - a. A monthly inspection
  - b. A weekly inspection
  - c. A monthly and yearly inspection
  - d. Semi-annually
4. To reduce the potential for a fire you should do this?
  - a. Clean your work space frequently keeping flammables & combustibles separated as needed.
  - b. Clean only at the end of the week.
  - c. Clean only when directed by the supervisor.
  - d. Leave all caps off flammable and combustible liquids.
5. The charge meter/gauge on the fire extinguisher should stay in what color section?
  - a. Green
  - b. Yellow
  - c. Purple
  - d. Red
  - e. Black
6. The inspection tag for the fire extinguisher should hang on the?
  - a. Wall
  - b. In the office
  - c. Be filed in book
  - d. Hang directly on the fire extinguisher.
7. Which of the following methods should be used on a fire extinguisher.
  - a. PREVENT
  - b. THROW
  - c. COVER UP
  - d. PASS
8. The most common Fire extinguisher found in our DOT trucks are?
  - a. Canisters
  - b. ABC
  - c. EIG
  - d. WATER
9. If the extinguishers have lost their charge, are damaged or missing labels, we should?
  - a. Keep on using them.
  - b. Have the passed on the next crew.
  - c. Turn them in for repair or replacement.
  - d. Wait until we have a need for them.
10. Class "A" fire extinguishers are rated for:
  - a. Wood, paper, and general trash
  - b. Fuels
  - c. Grease
  - d. Kitchen fires