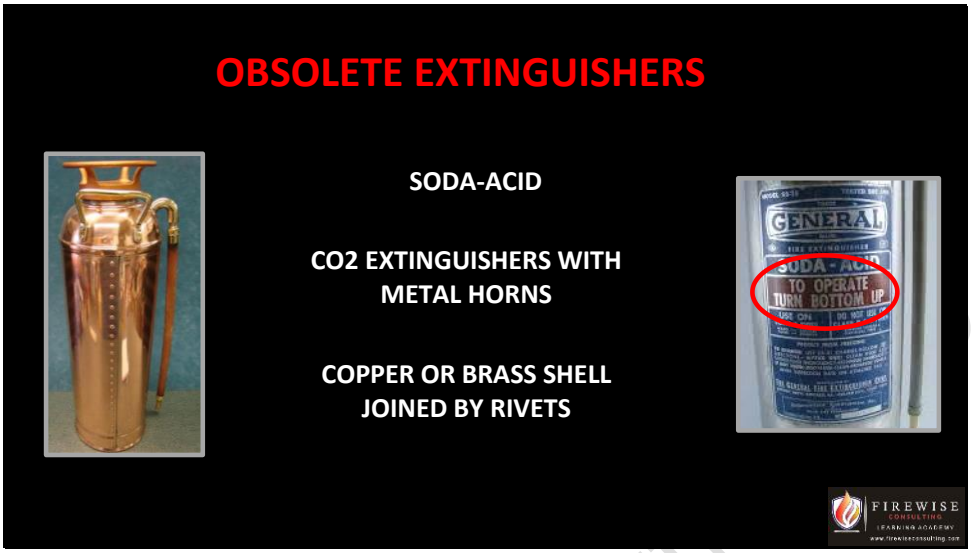
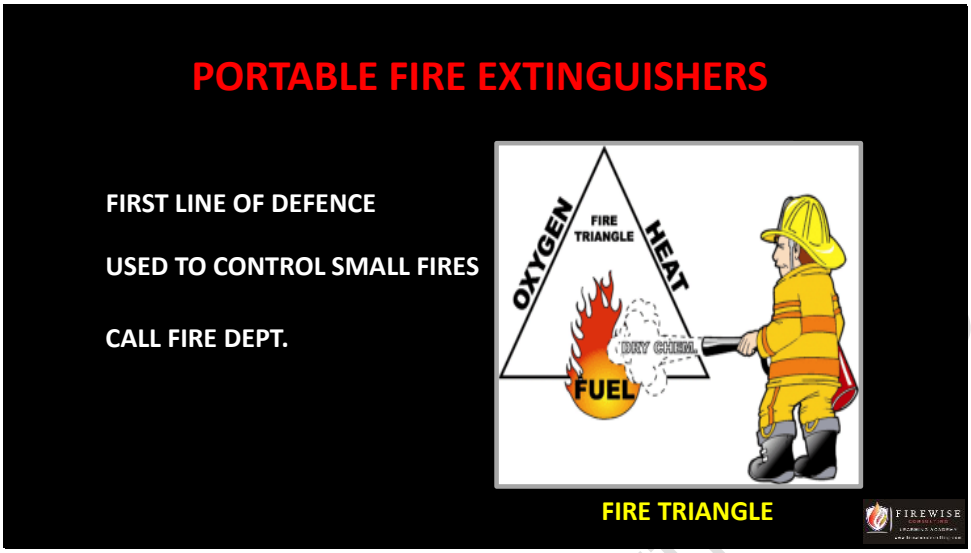
Welcome to Unit 5 Portable Fire Extinguishers. Most jurisdictions and Fire Codes require the installation of portable fire extinguishers in all buildings except dwelling units. A dwelling unit is defined as a room or suite of rooms used as a domicile by one or more people and usually contains living, cooking, sleeping and sanitary facilities. So an individual suite in an apartment building, one side of a duplex or a single family dwelling are all examples of dwelling units.
This unit deals with the selection, installation, inspection, testing and maintenance of portable fire extinguishers in accordance with NFPA 10. Portable fire extinguishers cannot be sold or installed unless they meet the appropriate ULC Standard and have a minimum of a 2 “A” rating.

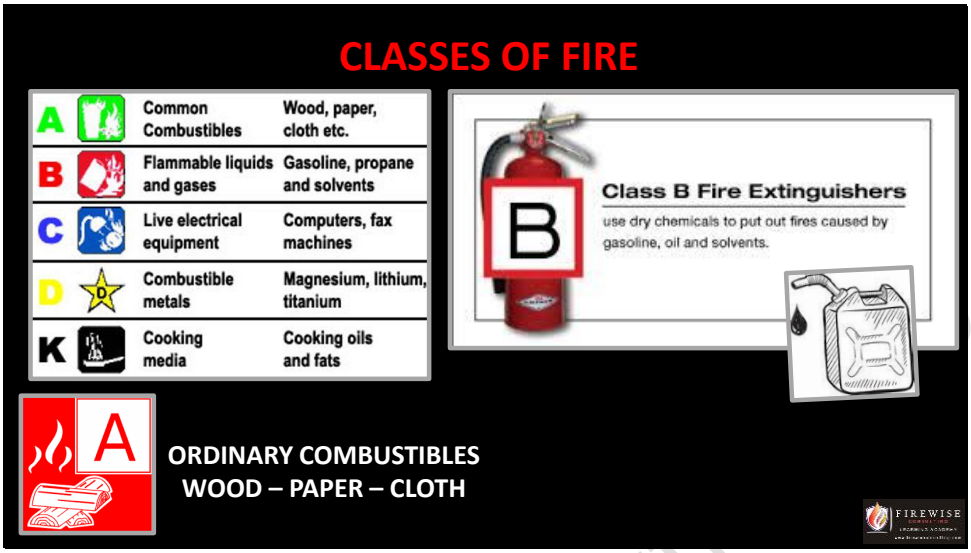


Some portable fire extinguishers are obsolete and may actually be dangerous. Examples include soda-acid, Carbon Dioxide extinguishers with metal horns and copper or brass shelled extinguishers that are soldered or riveted together. Any extinguisher that needs to be inverted to operate and any extinguisher that can no longer be serviced in accordance with the manufacturers maintenance manual is considered obsolete and should be removed from service.



Portable fire extinguishers and automatic sprinkler systems are the first suppression options for unwanted fire. Portable extinguishers should only be used in the very early stages of a fire when the flames are no larger than the person using the extinguisher. They are not intended for use on an out-of-control fire, such as one which has reached the ceiling, endangers the user through exposure to heat or smoke or otherwise requires the expertise of a fire department. No attempt to fight a fire should be made without signaling building occupants that there is a fire emergency, making sure the fire department has been called and there is a clear escape route between you and the fire. The operator should have read the extinguisher instructions and received training in its safe operation before attempting to attack the fire.

Fire is a chemical reaction that occurs when fuel, oxygen, and heat are combined and is represented by the fire triangle. Fire extinguishers work by removing one or more of the sides of the fire triangle, with different extinguishers working in different ways. For example, water extinguishers remove the heat while dry chemical extinguishers remove the supply of oxygen. Often gas fires like propane or natural gas are extinguished by turning off the fuel supply. It is important to select the right extinguisher for the hazard.



There are five basic types or classes of fire extinguishers, each of which extinguishes specific types of fire.

Newer fire extinguishers use a picture/labeling system to demonstrate which types of fires they are effective on so users can quickly identify which extinguisher to use. Older fire extinguishers are labeled with colored geometrical shapes with letter designations.

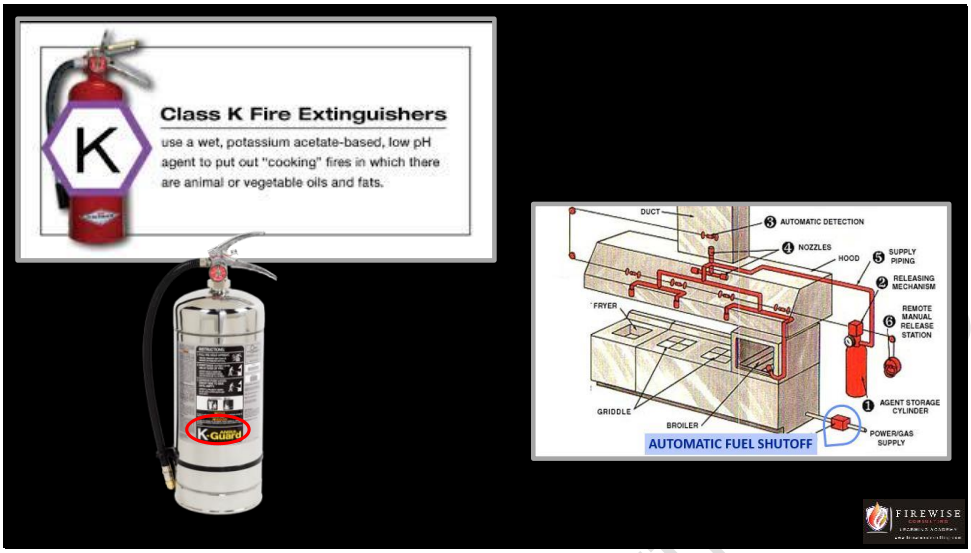
Class A fires consist of ordinary combustibles such as wood, paper, fabric, plastic, and most kinds of trash. Class A fires are usually suppressed by cooling with a water or multi-purpose dry chemical type of extinguisher.

Class B fires involve flammable or combustible liquids or gases. These fires follow the same basic principles as ordinary combustible fires, except that the fuel in question is a flammable liquid such as grease, oil, gasoline, or natural gas. A water based extinguisher should never be used to extinguish this type of fire because it can cause the fuel to scatter, spreading the flames. The most effective way to extinguish a flammable liquid or gas fueled fire is by inhibiting the chemical chain reaction of the fire, which is usually done with dry chemical or CO2 extinguishing agents.

Class C fires involve potentially energized electrical equipment. Electrical fires may be caused by a short-circuit, electrical overload or worn out electrical equipment. These fires can pose a severe hazard to firefighters using water or other conductive agents because electricity may be conducted from the fire, through water, to the firefighter's body. When the fire is, or possibly could be, electrically energized it should only be fought with a CO2 or dry chemical extinguisher rated for Class C or multi-purpose ABC type of fires.

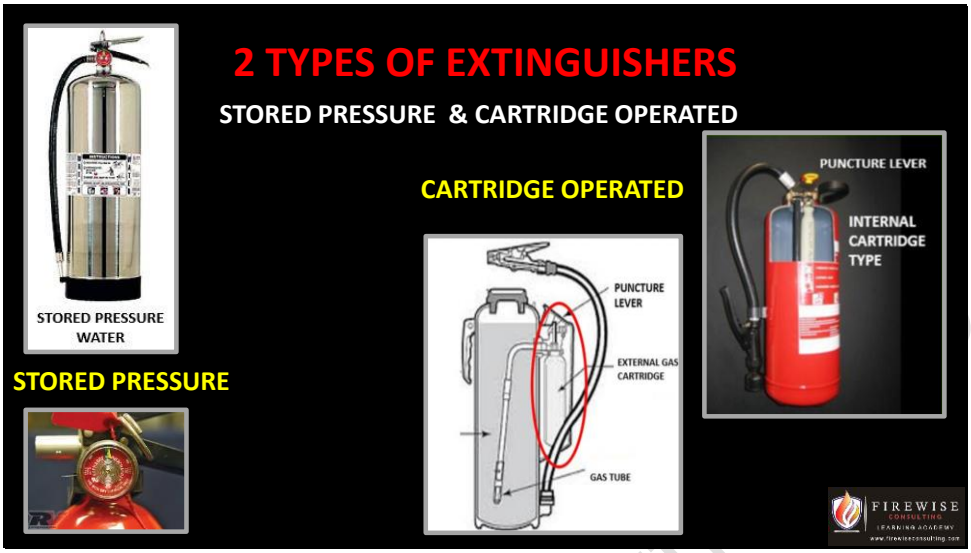
Once electricity is shut off to the equipment involved the fire becomes a Class A ordinary combustible fire and a Class A extinguisher can be used.

Class D fires involve combustible metals. Metal fires represent a unique hazard because most people are unaware of the characteristics of these fires and are not properly prepared to fight them. Therefore, even a small metal fire can spread and become a larger fire spreading to surrounding combustible materials. Only D rated extinguishers filled with dry powder should be used to extinguish a metal fire. In recent years a number of Class D fires involving lithium batteries were reported. In 2006 millions of lithium-ion battery packs made by Sony were replaced after several hundred overheated and a few caught fire. These batteries were used in laptop computers produced by a number of manufacturers. Since then, production processes have improved and fires remain relatively rare.



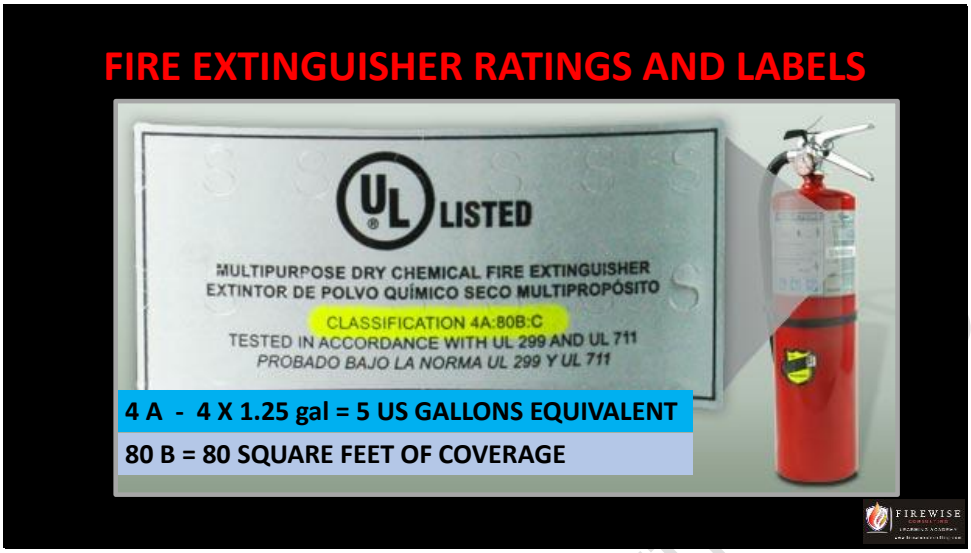
Class K fires involve cooking oils located in commercial kitchens. The special characteristics of these types of fires and the need for compatibility with built in fire extinguishing systems means special wet chemicals are required. Class K fires involve cooking fat and oils, and can spread quickly, causing damage and potential injury. Class K fires are technically a subclass of class B fires, since they involve flammable liquids but because of the unique characteristics related to this type of fire, it was designated separately and requires a distinct extinguishing agent.

It is critical that the right type and size of fire extinguisher be selected for the type of fire most likely to occur.



There are two main methods to charge portable fire extinguishers; stored pressure and cartridge-operated. Stored pressure are the most common type and in these units the expellant is stored in the same chamber as the firefighting agent itself. Depending on the agent used, different propellants are used. Water and foam extinguishers typically use compressed air to expel the extinguishing agent while in dry chemical extinguishers, nitrogen is typically used. All stored pressure extinguishers have a gauge showing the level of pressure in the chamber.

Cartridge-operated extinguishers contain the expellant gas in a separate cartridge either inside or attached to the outside of the fire extinguisher. The cartridge is punctured prior to discharge, exposing the propellant to the extinguishing agent. Cartridge type extinguishers are not as common as the stored pressure type but have the advantage of being quickly recharged, allowing an operator to discharge the extinguisher, recharge it, and return it to service in a reasonable amount of time.

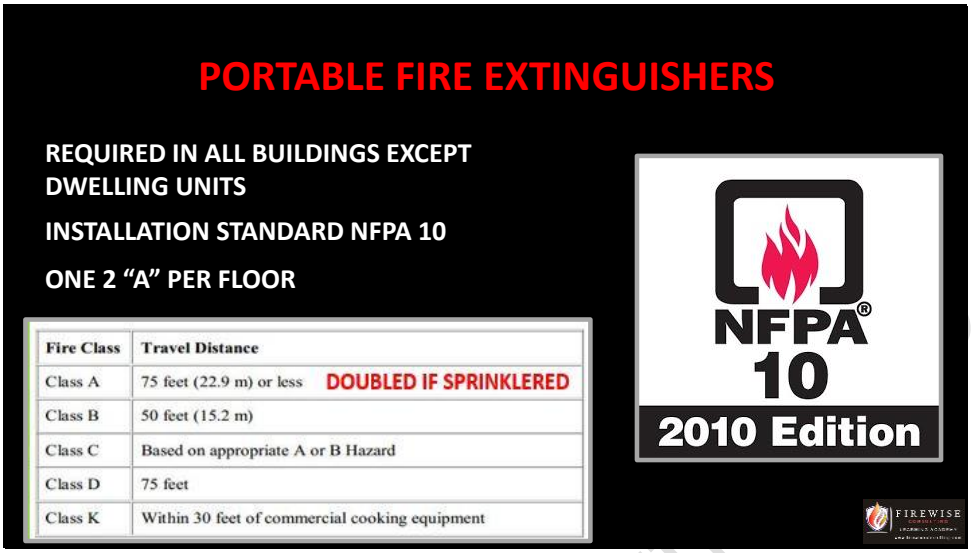


Portable fire extinguishers are approved and labeled for a certain class of fire. Class A and B extinguishers have numerical rating in addition to the Class rating that indicate the size of fire they can extinguish. Class C and D do not.

The ratings are an indication of how much fire an extinguisher will SAFELY extinguish. In this example the letters A, B, and C represent the class of fire for which the extinguisher has been approved. The number in front of the A rating indicates how much water the extinguisher is equal to and represents 1.25 gallons (US) of water for every unit of one. For example, this 4-A rated extinguisher would be equal to 5 (4 x 1.25) gallons of water.

The number 80 in front of the B rating represents the area in square feet of class B fire that a non-expert user should be able to extinguish. Using this example the 80-B:C should be capable of extinguishing 80 square feet of coverage.

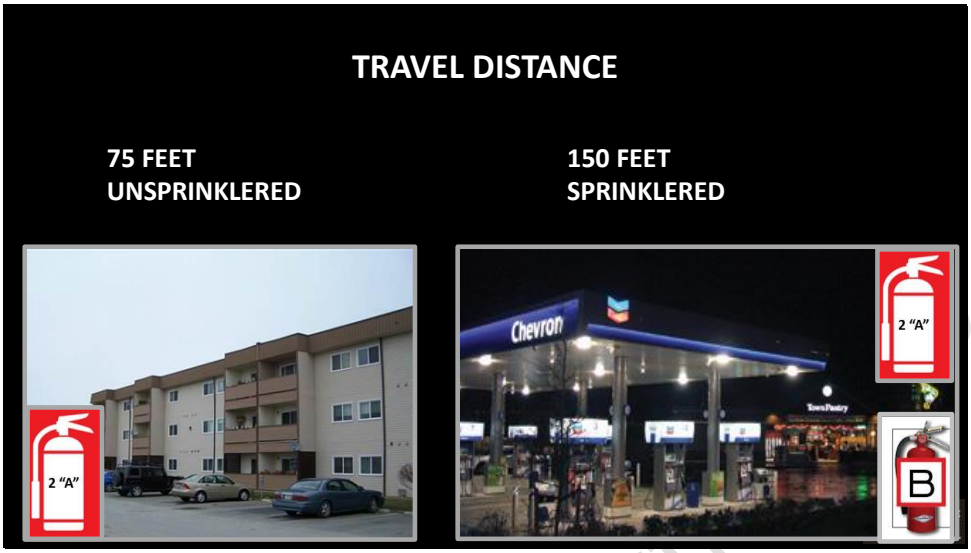
The bigger the numbers in the unit label, the bigger the fire the unit can handle. For example, a unit labeled 2A can handle a fire twice as big as a 1A unit. A 4A unit can handle a fire twice as big as a 2A unit.



Fire Extinguishers:

- Are required in every building except a private dwelling but private dwellings are well advised to install an extinguisher even though it is not a code requirement.
- Portable extinguishers must be selected and installed in conformance with NFPA 10 and ULC standards for portable fire extinguishers.
- There should be at least one 2 A rated portable fire extinguisher per floor.
- The maximum travel distance to a Class A fire extinguisher in unsprinklered buildings is 75 feet
- The travel distance can be doubled to 150 feet in sprinklered buildings

What this means is that at least one Class "A" rated portable extinguisher is required on each floor regardless of travel distance. That can be a simple "A" class extinguisher like a pressurized water extinguisher or it can be an ABC Multi-purpose dry chemical extinguisher as long the label indicates a minimum of a 2 "A" rating.

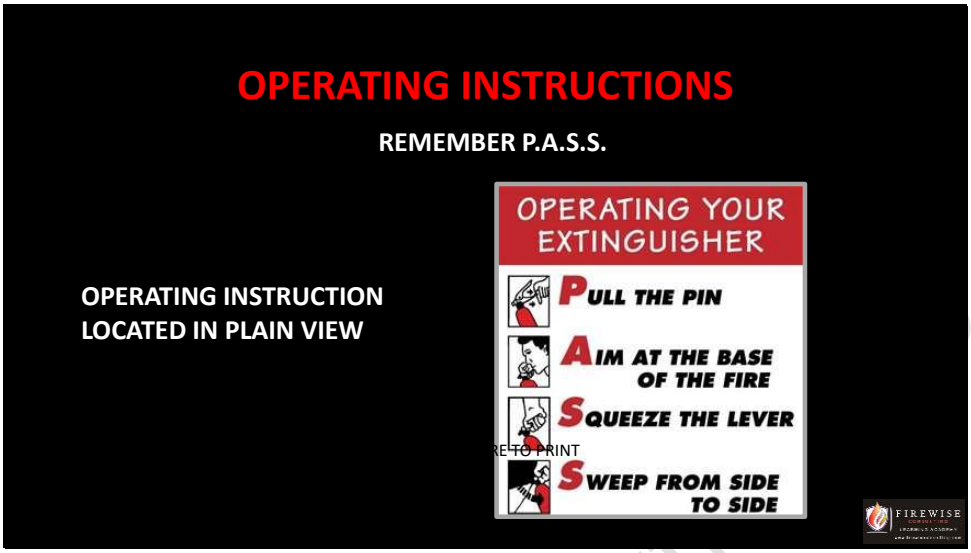


The distance between class "A" or multi-purpose ABC type extinguishers should be not more than 150 feet in unsprinklered buildings so the travel distance to the extinguisher from anywhere in the floor area should be no more than 75 feet. In sprinklered buildings the travel distance is doubled so extinguishers should be located not more than 300 feet apart which will maintain the required travel distance of 150 feet.

The type of extinguisher must be appropriate to the area covered. For example in a residential occupancy Class A extinguishers are required but at a vehicle refueling station Class B extinguishers must also be provided in addition to the class A extinguisher.

Portable extinguishers must be ULC approved with a minimum “2A” rating.

They must be fully charged and kept in a designated location
They must be visible and easily accessible preferably near an exit or along the normal path of travel to an exit
They must be conspicuously located where they are readily available for immediate use in the event of a fire
They must not be obstructed from view but in large rooms this may be unavoidable so signs may be used to indicate the location of the extinguisher
Extinguishers must be secured on a hanger or in wall cabinets designed for that purpose
If the extinguisher is installed where it may be subject to physical damage it must be protected from potential harm
The maximum height of the top of the extinguisher should be no more than five feet above the floor
The bottom of the extinguisher should be no less than four inches above the floor.

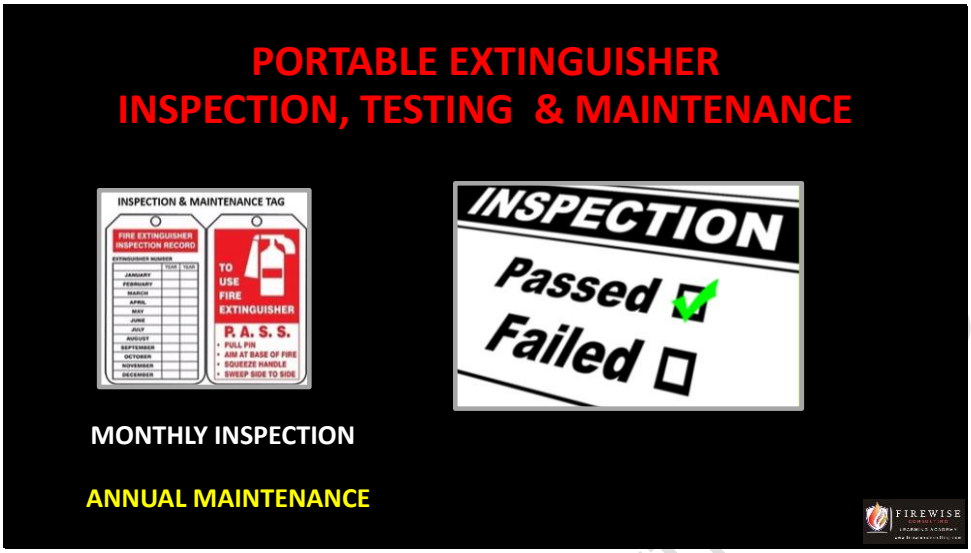


The operating instructions must be located on the extinguisher label and should be facing outward in plain view. Building occupants should be familiar with the location of portable extinguishers and how to use them. You can contact your fire department to find out more about fire extinguisher training.

One way to remember how to operate a portable extinguisher is the acronym PASS.

PASS stands for PULL the Pin – AIM low at the base of the fire SQUEEZE the trigger and SWEEP slowly from side to side.

Even if you are successful in extinguishing the fire, the fire department will still want to perform a site inspection.



The owner or the owner's agent is responsible for inspection, testing and maintenance of all fire safety systems including portable fire extinguishers. Portable fire extinguishers require monthly inspection and annual maintenance. Annual inspections need to be performed by a qualified technician or fire protection service company acceptable to the Authority Having Jurisdiction. The technician must place a tag on the extinguisher to indicate the type of service performed which could include annual inspection, recharge or that a new fire extinguisher has been installed.

Monthly Inspections

Inspections of portable fire extinguishers are required to be performed at least monthly. A log book should be kept that records who did it and when the inspection was completed along with any comments about conditions found. The inspection makes sure the extinguisher is in its designated location, that the pressure gauge is in the operational range, or the fullness of the extinguisher is confirmed by weight and that the safety seal is intact and an annual maintenance tag is attached to the unit.

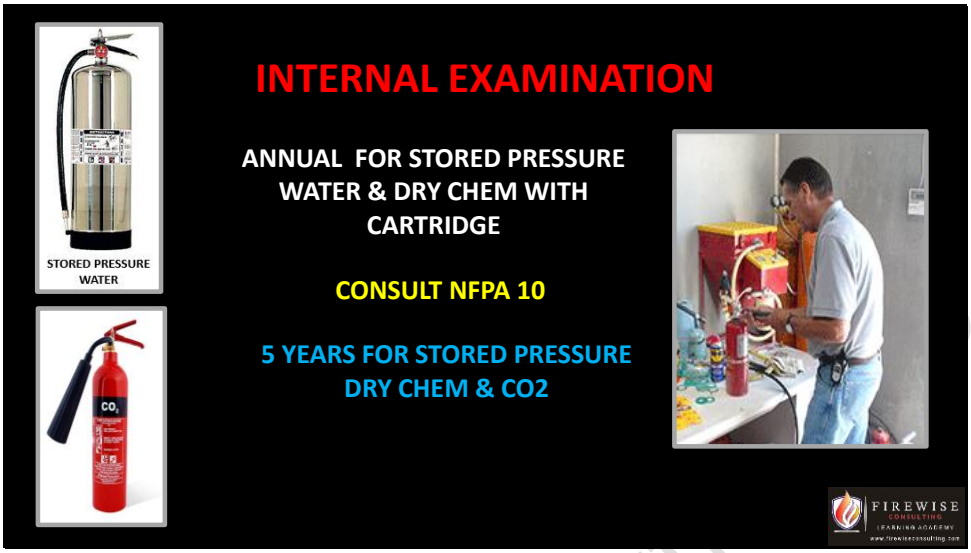
People performing monthly inspections are not required to be certified.

Annual Inspection

The person doing the annual inspection must be certified and acceptable to the authority having jurisdiction.

When performing maintenance and recharging they need to have the appropriate manufacturers service manuals, tools and replacement parts listed for the fire extinguisher.

This inspection includes a visual examination to detect obvious physical damage, corrosion, or nozzle blockage and must verify that the operating instructions are present, legible, and facing outward. The inspector must also check the hydrostatic test due date. When the annual inspection is performed the tamper proof seal must be removed by operating the pull pin or locking device and replaced with a new seal. The extinguisher must have a tag or label attached indicating the month and year the inspection was done, the initials of the person performing the work and the name of the company performing the work.



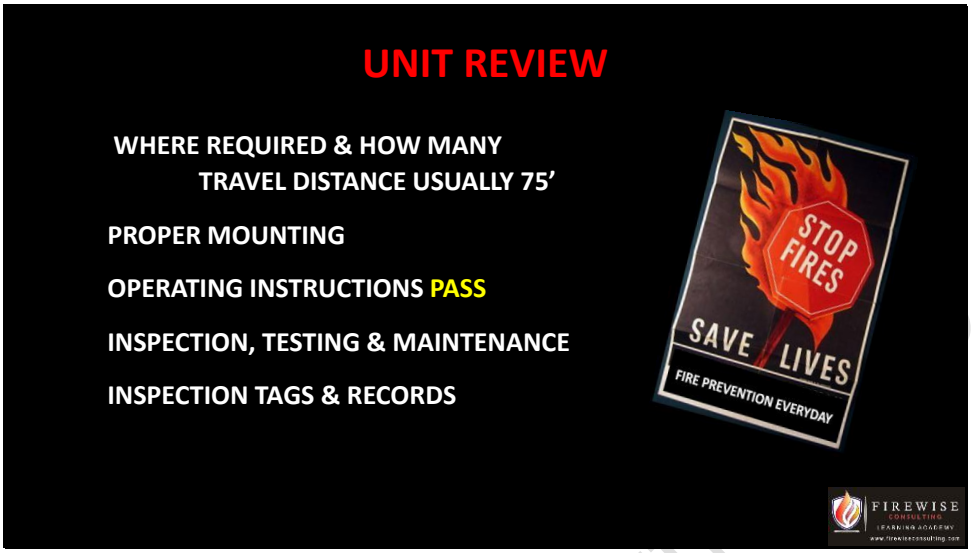
An internal examination of certain types of extinguishers is also required at varying frequencies. Loaded stream or stored pressure water extinguishers, pump tank extinguishers and dry chemical extinguishers that have a cartridge to pressurize the extinguisher must undergo internal examination annually. Most stored pressure dry chemical and CO2 extinguishers have a 5 year interval between internal examinations.

For exact requirements look in NFPA 10 which is available online.

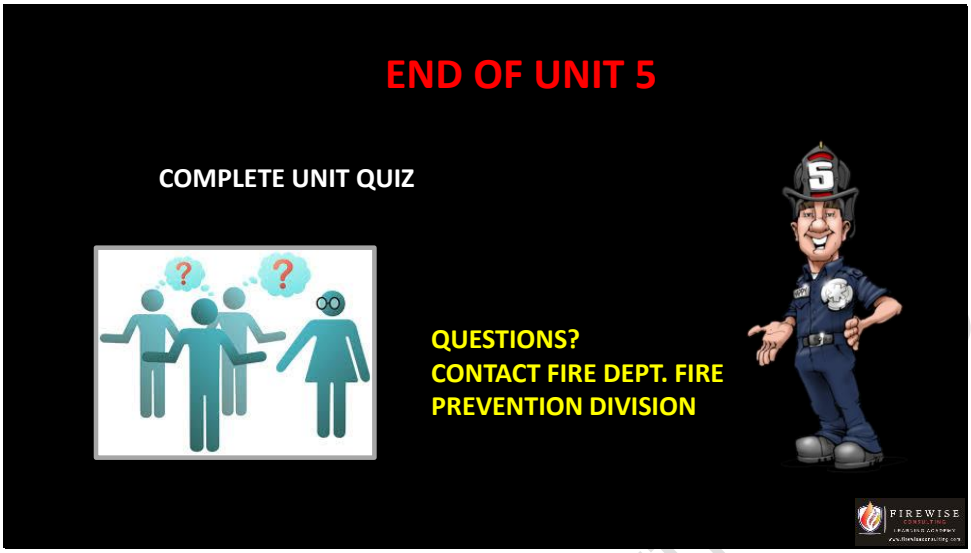
The manufacturer's instructions for care and maintenance of the extinguisher must be followed.

Rechargeable extinguishers must be serviced after every use.
Disposable models can only be used once and must be replaced after each use.

In this unit we discussed;
That portable extinguishers should be ULC approved and be installed in conformance with NFPA 10.
That portable extinguishers should only be used in the very early stages of a fire
No attempt to fight a fire should be made without signaling building occupants and the fire department
Fire extinguishers work by removing one or more of the sides of the fire triangle,
Selecting the right extinguisher is critical
The five classes of fire extinguishers A, B, C, D, & K
2 methods to charge portable fire extinguishers; stored pressure and cartridge-operated
Portable extinguisher labels and ratings. Ratings are an indication of how much fire an extinguisher will put out



Where and how many extinguishers are required. In unsprinklered buildings travel distance to an extinguisher should be not more than 75 feet which means they can be 150 feet apart.
Mounting of extinguishers so they are easily accessible in the event of an emergency
Operating an extinguisher and the PASS system
Inspection, testing and maintenance of portable fire extinguishers
And
The importance of inspection tags and records.



Congratulations that is the end of Unit 5 which dealt with portable fire extinguishers. You are now ready to move on to Unit 6 which deals with fire safety plans but first please complete the Unit Quiz. If you have any questions please contact your local fire department fire prevention division.