

## Goal

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This program is designed to provide information on the correct use of portable fire extinguishers.

## Objective

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Workers will be able to identify the different classes of fires, and select and properly use the appropriate fire extinguisher for each class of fire.

## Introduction

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Fire is a chemical reaction involving the rapid burning of fuel. Fuel can be any combustible material—solid, liquid or gas. Fires need four elements to occur: fuel, oxygen (16% or more), heat, and chemical reaction. Remove any of these factors and the fire cannot occur or will extinguish itself if it is already burning.

The effectiveness of a fire extinguisher on a particular fire depends on the size of the fire and the amount and type of agent in the extinguisher. Different extinguishing agents can be used to put out different classes of fires. Portable fire extinguishers are effective in putting out small fires, but care must be taken in their proper selection and use. To select the proper fire extinguisher, you must first become familiar with the different classes of fires.

## Classes of Fires

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Class A fires have ordinary combustible materials, such as wood, paper, cloth, rubber and some plastics. Cooling the material below its ignition temperature and soaking the fibers should prevent re-ignition. Pressurized water, foam, or multi-purpose dry chemical extinguishers should be used. Never use carbon dioxide or ordinary dry chemical extinguishers on a Class A fire.

Class B fires involve flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. These types of fires should be extinguished by using foam, carbon dioxide, ordinary dry chemical, multi-purpose dry chemical, and halon extinguishers.

Class C fires involve energized electrical equipment, such as appliances, switches, panel boxes, and power tools. Carbon dioxide, ordinary dry chemical, multi-purpose dry chemical, and halon fire extinguishers may be used to fight Class C

fires. Water should never be used on electrical fires because of the shock hazard.

Class D fires involve certain combustible metals, such as magnesium, titanium, potassium, and sodium. These metals burn at temperatures high enough to pull oxygen out of other materials sufficient to support combustion. They may react violently with water or other chemicals, and must be handled with care. Dry powder extinguishing agents especially designed for the particular material involved should be used.

## Types of Extinguishers

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To be sure you are fighting a fire with the proper extinguisher, it is important to know how to identify the different types. Fire extinguishers have color-coded symbols on their faceplate to show their classification (A—green triangle, B—red square, C—blue circle, D—yellow star). Some extinguishers are marked with multiple ratings such as AB, BC or ABC. These extinguishers are capable of putting out more than one class of fire.

*Class A and B* extinguishers also carry a numerical rating that tells how large a fire can safely be put out with that extinguisher, (e.g. 2-A; 4-B). The larger the number, the larger the fire that extinguisher can put out. However, the higher the rating number also means the heavier the extinguisher.

*Class C* extinguishers have a letter rating “C” to indicate that the extinguishing agent will not conduct electrical current. Class C extinguishers must also carry a Class A or B rating.

*Class D* extinguishers carry only a letter rating indicating their effectiveness on certain amounts of specific metals (e.g., magnesium, 5 lbs.; sodium, 3 lbs.).

## Placement

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Employers are responsible for the selection and placement of portable fire extinguishers. Selection is made based on the classes of fires likely to occur in the immediate work area. Placement should be such that they are readily accessible to workers without subjecting them to possible injury. (For specific placement requirements see CODE OF FEDERAL REGULATION 29 1910.157(d)(2-6).

## How to Use

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In operating a fire extinguisher, it is helpful to remember the word “PASS” to guide you through each step. PASS stands for Pull, Aim, Squeeze, and Sweep.

Step 1–Pull the pin. Some extinguishers require releasing a lock latch or pressing a puncture lever.

Step 2–Aim low. Point the extinguisher nozzle at the base of the fire.

Step 3–Squeeze the handle while holding the extinguisher upright. This releases the extinguishing agent.

Step 4–Sweep from side to side. Keep the extinguisher aimed at the base of the fire, and sweep back and forth until it appears to be out. Watch the fire area. If fire breaks out again, repeat the process.

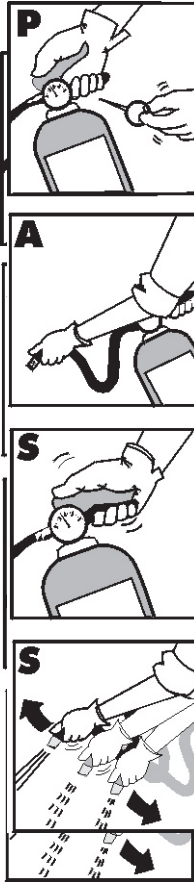
Most portable extinguishers work according to these directions. Each unit carries specific directions for its use printed on the extinguisher case. It is important to be familiar with these instructions before an emergency.

## When Not to Fight a Fire

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Portable fire extinguishers have their limitations. They are not designed to fight a large or spreading fire. Even against small fires, they are useful only under certain conditions. The following is a list of situations in which you should not attempt to fight a fire.

- The extinguisher is not rated for the class of fire.
- The extinguisher is not large enough to put out the fire or is not fully charged. Most portable extinguishers discharge completely in as few as eight seconds.
- The fire is spreading beyond the spot where it started.
- The fire can block your only escape. If this is a possibility then evacuate the area.



## Care and Maintenance

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Fire extinguishers require routine inspection, maintenance, and testing. Employers are responsible for the required monthly visual and annual maintenance checks. Routine maintenance information is included with the operator’s manual or may be obtained from the manufacturer. Specific information on hydrostatic testing of fire extinguishers is contained in CFR 29 1910.157(f).

Reusable fire extinguishers must be recharged after every use. Disposable fire extinguishers can be used only once and must be replaced after one use or 12 years from the date of manufacture.

Employers are also required to maintain records showing that the required tests have been performed at the time intervals shown in CFR 29 1910.157(f)(3) Table L-1. Certification records include the date of the test, the signature of the person who performed the test and the serial number of the fire extinguisher that was tested. These records should be kept until the extinguisher is hydrostatically retested at the required time interval or until the extinguisher is taken out of service.

## Training

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If extinguishers are to be used by employees, then training needs to take place upon initial employment and at least annually thereafter. If extinguishers are not intended for employee use and the employer has an emergency action plan and a fire prevention plan, then training is not required.

## Review Questions

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1. Fire extinguishers work by removing one of the four elements required for a fire to occur. (True or False)



2. Which is not one of the four steps in operating most portable fire extinguishers?
  - a. Lift
  - b. Pull
  - c. Aim
  - d. Squeeze
  - e. Sweep
  
3. Class D fires involve combustible metals.  
(True or False)
  
  
4. On what types of fire should you never use water?
  - a. Wood
  - b. Paper
  - c. Electrical
  - d. Cloth
  
  
5. What is the minimum percentage of oxygen in the atmosphere required to sustain a fire?
  - a. 15%
  - b. 16%
  - c. 17%
  - d. 14%

## Answers

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1. True
2. a
3. True
4. c
5. b

The Texas Department of Insurance,  
Division of Workers' Compensation (TDI/DWC)  
E-mail [resourcecenter@tdi.state.tx.us](mailto:resourcecenter@tdi.state.tx.us)  
or call 1-800-687-7080 for more information.

## Resources

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The Texas Department of Insurance, Division of Workers' Compensation (TDI) Resource Center offers a workers' health and safety video tape library. Call (512) 804-4620 for more information or visit our web site at [www.tdi.state.tx.us](http://www.tdi.state.tx.us).

Disclaimer: Information contained in this training program is considered accurate. For complete information on rules and regulations on portable fire extinguishers, please consult Title 29 of the Code of Federal Regulations 29 (CFR) Part 1910.157.

*Safety Violations Hotline*  
**1-800-452-9595**  
**safetyhotline@tdi.state.tx.us**