

Goal

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

Objective

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

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 depends on the size of the fire and the amount and type of agent in the extinguisher. Different extinguishing agents should 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

Class A fires involve 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.

Class B fires involve flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners, and propane.

Class C fires involve energized electrical equipment, such as appliances, switches, panel boxes, and power tools.

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.

Class K fires involve combustible cooking fluids such as oils and fats.

CLASS OF FIRE	TYPES OF FIRE
A Ordinary Combustibles	Wood Paper Rubber Plastic
B Flammable Liquids	Liquids Greases Gases
C Electrical Equipment	Energized Electrical Equipment
D Combustible Metals	Magnesium Zinc Calcium Titanium Lithium
K Cooking Media	Vegetable Oils Animal Oils Fats / Lards

Types of Extinguishers

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, and K – black hexagon). Generally, the class of a fire corresponds with the type of extinguisher that should be used to put it out, but some extinguishers, known as multi-purpose dry chemical extinguishers, can put out more than one class of fire. These are marked with multiple ratings such as AB, BC, or ABC.

Type A extinguishers are water / air-pressurized water extinguishers (APW). The containers are large and silver and are filled with water and pressurized air. Sometimes they also contain a detergent intended to produce foam. These should never be used on Class B or Class C fires.











Type B extinguishers are carbon dioxide extinguishers. The containers have a hard horn and no pressure gauge. They are filled with carbon dioxide to take the oxygen element out of the fire. Dry ice may also shoot from the extinguisher because of the high pressure in the container. These should never be used on a Class A fire or in a confined space.

Type A and B extinguishers also carry a numerical rating that tells how large of 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 and the heavier the extinguisher.

Type C extinguishers are like Type B extinguishers and contain either carbon dioxide or another dry chemical intended to prevent the conduction of electrical current. These should never be used on a Class A fire or in a confined space.

Type D extinguishers are also like Type B and Type C extinguishers except that they either separate the fuel from the oxygen element or remove the heat element. They are also called dry powder extinguishers. They carry only a letter rating indicating their effectiveness on certain amounts of specific metals (e.g. Magnesium, 5 lbs.; sodium, 3 lbs.) and they should only be used on Class D fires.

Type K extinguishers can be either dry or wet chemical extinguishers specifically intended for kitchen fires. These are only intended to be used in conjunction with built-in hood suppression systems. They are also electrically conductive so the power to the burning appliance should be cut off before the extinguisher is used.

EXTINGUISHER SYMBOLS	
RATING SYMBOL	PICTURE SYMBOL
	
	
	
	
	

Placement

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.

How to Use



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 operate per 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

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 or is not otherwise contained
- The fire can block your only escape – if this is a possibility, evacuate the area

Care and Maintenance

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 in the operator's manual or may be obtained from the manufacturer.

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.

Training

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.

1. Fire extinguishers work by removing one of the four elements required for a fire to occur.
True/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/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

1. True
2. A
3. True
4. C
5. B

For more information on fire safety and other topics see the Service Lloyds website. In Risk Control's Training Materials section, we have additional resources including:

- Fire Safety – Toolbox Talk
- House and Building Fires – Toolbox Talk
- Fire Prevention for Small Businesses
- Parlay Handouts:
 - A Guide to Worksite Fire Safety
 - The Fire Triangle
 - Worksite Fire Emergencies

Remember to practice Safety; don't learn it by accident.

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