

# On-Line Fire Extinguisher Training



The USC Fire Safety Office is delighted you have chosen to take the on-line version of our fire extinguisher training.

This power-point presentation will give you some knowledge about the “fire triangle,” the different classification of fires, the different types of fire extinguishers, and give you instruction on how to properly use a fire extinguisher.

You may navigate this slide-show at your own pace. After you have viewed all of the pages, you will be asked to take a post-test. Complete the test on-line, then click the “Send Quiz and Record” button at the bottom of the test page. The quiz will be automatically graded and recorded. The results will be displayed to you. If you pass, print the “certificate” as written documentation that you have received training, and keep it in your personal files.



Remember, you will not receive credit for this training without completion and submission of the post-test. This also assists the Fire Safety Office in documenting your safety training.

If you would like to have a hands-on classroom presentation, which includes a “live” fire and laser-guided fire extinguisher, contact our office at 777-5269.



# Fire Extinguisher Training



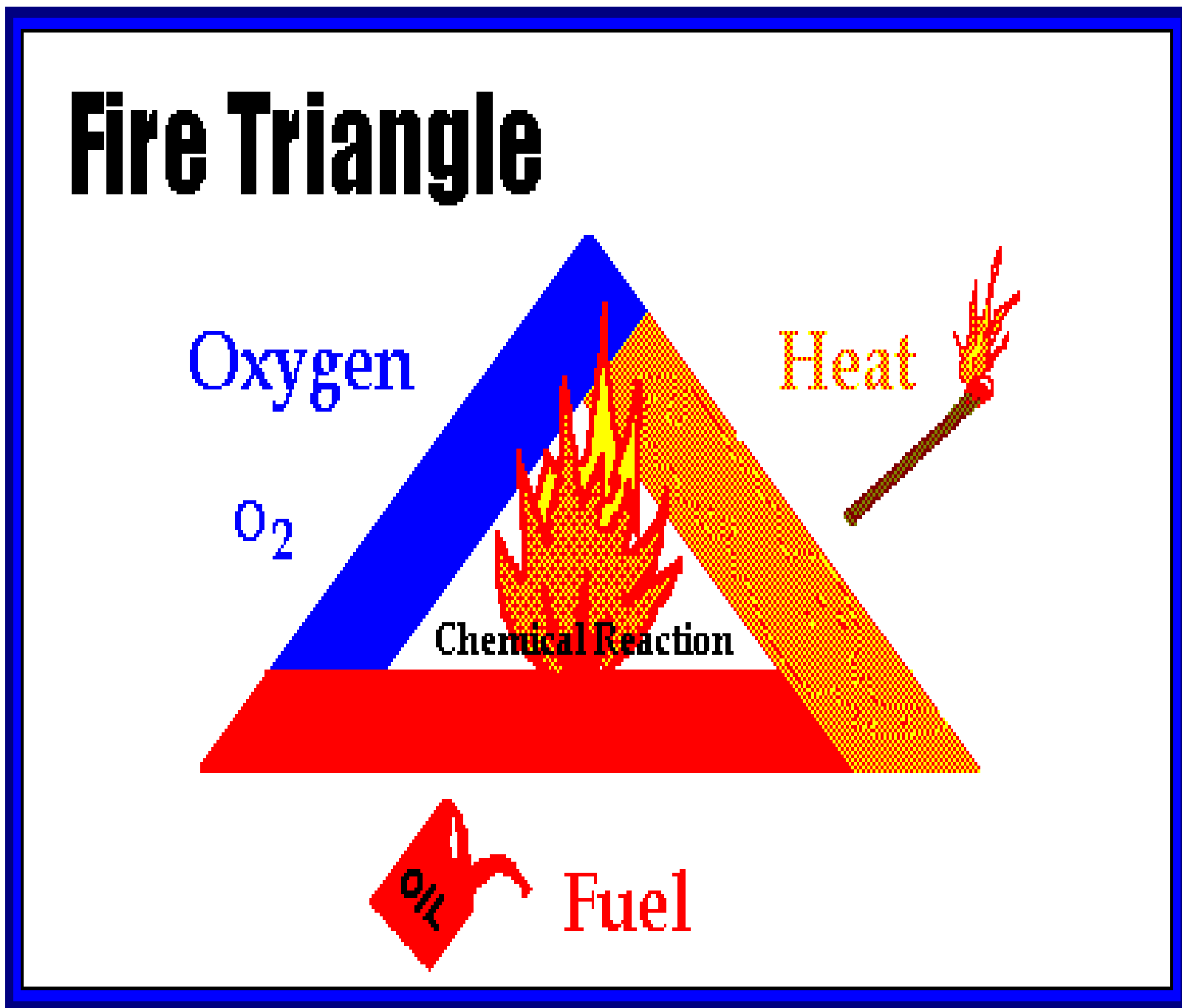
In order to understand how fire extinguishers work, you first need to know a little bit about fire.

**Four** things must be present at the same time in order to produce fire:

1. Enough **OXYGEN** to sustain combustion
2. Enough **HEAT** to raise the material to its ignition temperature
3. A **FUEL** source or combustible material
4. A **CHEMICAL REACTION** to start the fire



Take a look at the following diagram, called the “Fire Triangle”



# The Fire Triangle

Oxygen, heat and fuel are frequently referred to as the “fire triangle.”

Add in the fourth element, the chemical reaction, and you actually have a fire.

The important thing to remember is that if you take any of these elements away, you will not have a fire, or the fire will be extinguished.






Fire extinguishers put out fires by taking away one or more of the elements of the fire triangle.

Fire safety, at its most basic, is based upon the principle of keeping fuel sources and ignition sources separate.



# Classification of Fires

Fires are classified depending on the fuel source. It is very important to understand the different classifications of fires because if you use the wrong type of fire extinguisher on the wrong type of fuel source, you can make matters worse.

<b>A</b>		Common Combustibles	Wood, paper, cloth etc.
<b>B</b>		Flammable liquids and gases	Gasoline, propane and solvents
<b>C</b>		Live electrical equipment	Computers, fax machines
<b>D</b>		Combustible metals	Magnesium, lithium, titanium
<b>K</b>		Cooking media	Cooking oils and fats

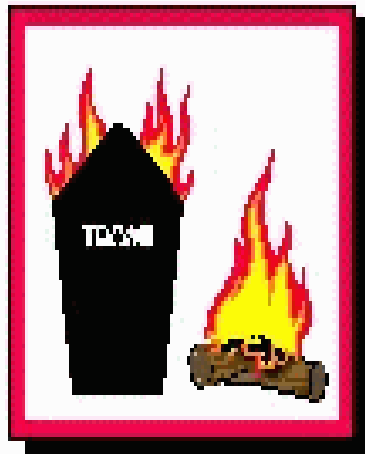




The most common types of fires are:



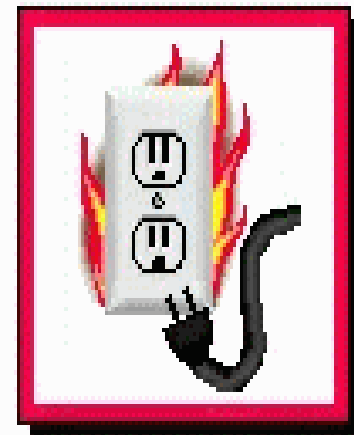
**Ordinary  
Combustibles**



**Flammable  
Liquids**



**Electrical  
Equipment**



# Types of Fire Extinguishers



# Water Extinguishers

Air-pressurized water extinguishers are known as “APWs” or simply “water cans.”

Water extinguishers are large silver extinguishers which are filled about two-thirds of the way with ordinary tap water, then pressurized with normal air. In essence, it is just a giant squirt gun!

Water extinguishers stand about 2 feet tall and weigh approximately 25 pounds when full. They are designed for Class A fires only.





Most extinguishers will have a pictograph label telling you which fires the extinguisher is designed to fight. For example, a simple water extinguisher might have a label like this one, indicating that it should only be used on **Class A** fires.

\* Notice the red lines struck through the symbols for the “B” & “C” fires on this extinguisher.



# Points to Remember about APWs

Never use water to extinguish flammable liquid fires. Water is extremely ineffective at extinguishing Class B fires. In fact, you may spread the fire if you try to use water on it!

Never use water to extinguish an electrical fire. Water is a good conductor of electricity, and there is some concern for electrocution if you were to use water to extinguish a Class C fire.

But...after unplugging, or de-energizing electrical equipment, including computers, you may use a water extinguisher on the fire. After the electricity has been turned off, the fire is typically a Class A fire. If you are not sure if the electricity has been turned off, treat it as a Class C fire.

APWs extinguish fire by taking away the “heat” element of the fire triangle.



# Carbon Dioxide (CO<sub>2</sub>) Extinguishers

Carbon Dioxide extinguishers are filled with non-flammable carbon dioxide gas under extreme pressure. You can recognize a CO<sub>2</sub> extinguisher by its hard “horn” and lack of pressure gauge. The pressure in the cylinder is so great that when you use one of these extinguishers, bits of dry ice may shoot out of the horn.

CO<sub>2</sub> cylinders are red and range in size from 5 pounds or larger. In the larger sizes, the hard horn will be attached on the end of a long, flexible hose.

CO<sub>2</sub> extinguishers are designed for Class B & C fires.



# CO<sub>2</sub>S

Carbon dioxide extinguishers work by displacing oxygen, or taking away the oxygen element of the fire triangle. The carbon dioxide is also very cold as it comes out of the extinguisher, so it cools the fuel as well.

CO<sub>2</sub>s may be ineffective at extinguishing Class A fires because they may not be able to displace enough oxygen to successfully put the fire out. Class A materials may also smolder and re-ignite.

CO<sub>2</sub>s will frequently be found in laboratories, mechanical rooms, kitchens, and flammable liquid storage areas.

The smoke from CO<sub>2</sub>s help introduce the Carolina football team (and Cockey) as they enter Williams-Brice stadium!



# Dry Chemical Extinguishers

Dry Chemical Extinguishers come in a variety of types. You may see them labeled:

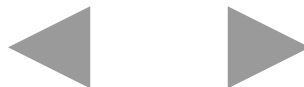
“DC”                    short for dry chemical

“ABC”                  indicating that they are designed for Class A B C fires

“BC”                    indicating that they are designed for Class B C fires

Almost all dry chemical extinguishers on the USC campus are **A B C**

ABC extinguishers are filled with a fine yellow powder. The greatest portion of this powder is composed of mono-ammonium phosphate and ammonium sulfate. Nitrogen is used to pressurize the extinguishers.





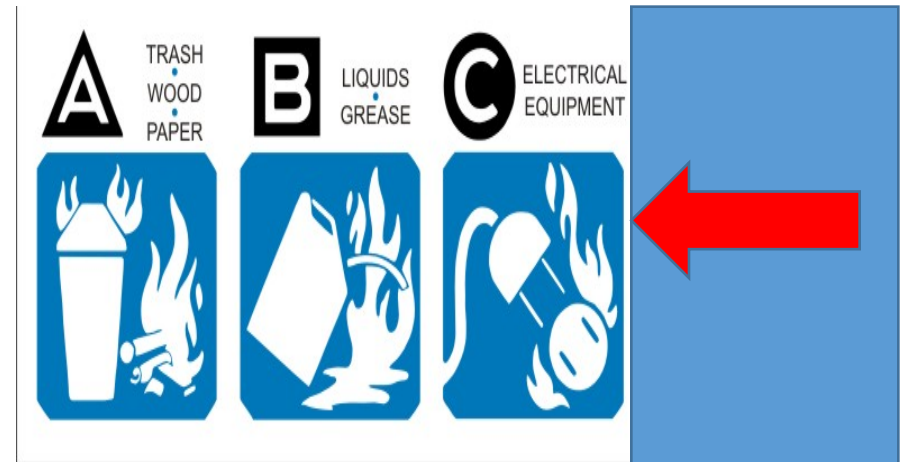
ABC extinguishers are red and range in size from 5-20 pounds. There are over 4800 ABC fire extinguishers on the USC campus!

It is extremely important to identify which type of dry chemical extinguisher is located in your area. Always read the labels and know their locations.

You do not want to mistakenly use a BC extinguisher on a Class A fire. BC extinguishers are typically found in commercial kitchens or areas with flammable liquids.



ABC extinguishers will have a label like this, indicating that it may be used on Class ABC fires.



Dry chemical extinguishers put out fire by coating the fuel with a thin layer of dust, separating the fuel from the oxygen in the air. The powder also works to interrupt the chemical reaction of fire, so these extinguishers are extremely effective at putting out fire.

These extinguishers will be found in many different locations...labs, mechanical rooms, break rooms, chemical storage areas, offices, university vehicles, etc.



# Rules for Fighting Fires

Fires can be very dangerous and you should always be certain that you will not endanger yourself or others when attempting to put out a fire.

For this reason, when a fire is discovered:

- 1. Sound the Alarm** If you discover or suspect a fire, sound the building fire alarm. If there is no alarm in the building, warn other occupants by knocking on doors and shouting as you leave.
- 2. Leave the Building** Try to rescue others only if you can do so safely. Move away from the building and out of the way of the fire department. Don't go back into the building until the fire department says it is safe to do so.
- 3. Call the Fire Department Dial 911** (If you are on the USC - Columbia campus, dial 7-9111 if you are using a university office phone, or dial 777-9111 if you are using a mobile phone.) Give the dispatcher as much information as possible, and don't hang up until you are told to do so.



# Total and immediate evacuation is safest!

Only use a fire extinguisher if the fire is very small (about the size of a trashcan) and you know how to use it. If you can't put out the fire, leave immediately.

Make sure the fire department is called – even if you think the fire is out.

However...

before deciding to fight a fire, keep the following rules in mind:



# Never Fight a Fire if...

- **You don't know what is burning.** If you don't know what the fuel source is, you don't know what type of fire extinguisher to use. Even if you have an ABC extinguisher, there may be something in the fire which is going to explode or produce highly toxic smoke. Chances are you will know what is burning, but if you don't, let the fire department handle it.
- **The fire is spreading rapidly beyond the spot where it started.** The time to use an extinguisher is in the beginning (incipient) stage of a fire. If the fire is already spreading quickly, it is best to simply evacuate the building, closing doors and windows behind you as you leave.
- **Your instincts tell you not to.** If you are uncomfortable with the situation for any reason, just let the fire department do their job.



The final rule is to **ALWAYS** position yourself with an exit or means of escape at your back before you attempt to use an extinguisher to put out a fire.

In case the extinguisher malfunctions, or something unexpected happens, you need to be able to get out quickly, and you don't want to become trapped.

Remember, always keep your back to an exit.



# How to Use a Fire Extinguisher

It's easy to remember how to use a fire extinguisher if you can remember the acronym

P A S S



# Remember the **PASS** Word

## Pull

**Pull** the pin (or other motion) to unlock the extinguisher.



The pin will be locked in place with a plastic tie. Simply pull or twist the pin to break the tie.

## Aim

**Aim** at the base (bottom) of the fire and stand 6 - 10 feet away.



Aim at the base of the fire...you want to attack the fuel source – not the flames.

## Squeeze

**Squeeze** the lever to discharge the agent.



Fully depress (or squeeze) the handles together to discharge the element contained in the extinguisher.

## Sweep

**Sweep** the spray from left to right until the flames are totally extinguished.



Sweep from side-to-side at the base of the fire.





You have now completed  
the fire extinguisher  
training program!

Click on the  button to  
advance to the post-test to receive  
credit for this training.

