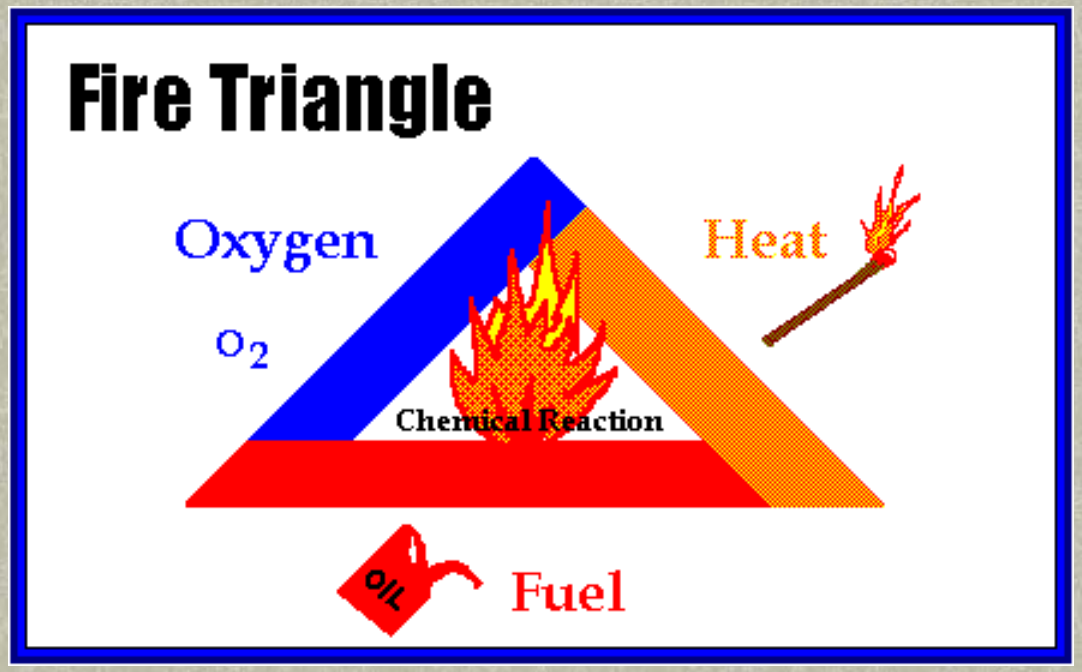
Fire Extinguisher Training

The Fire Triangle



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

The Fire Triangle

Three things must be present at the same time to produce fire:

1. **Enough OXYGEN to sustain combustion**
2. **Enough HEAT to reach ignition temperature**
3. **Some FUEL or combustible material**

Together, they produce the CHEMICAL REACTION that is fire

Take away any of these things and the fire will be extinguished

Fuel Classifications

- Fires are classified according to the type of fuel that is burning.
- If you use the wrong type of fire extinguisher on the wrong class of fire, you might make matters worse.
- Its very important to understand the four different fire (fuel) classifications…

Fuel Classifications

Class A: Wood, paper, cloth, trash, plastics—solids that are not metals.

Class B: Flammable liquids—gasoline, oil, grease, acetone. Includes flammable gases.

Class C: Electrical—energized electrical equipment. As long as it's "plugged in."

Class D: Metals—potassium, sodium, aluminum, magnesium. Requires Metal-X, foam, and other special extinguishing agents.

Fuel Classifications

Most fire extinguishers will have a pictograph label telling you which types of fire the extinguisher is designed to fight.

For example, a simple water extinguisher might have a label like this…

…which means it should only be used on Class A fires.

Types of Fire Extinguishers

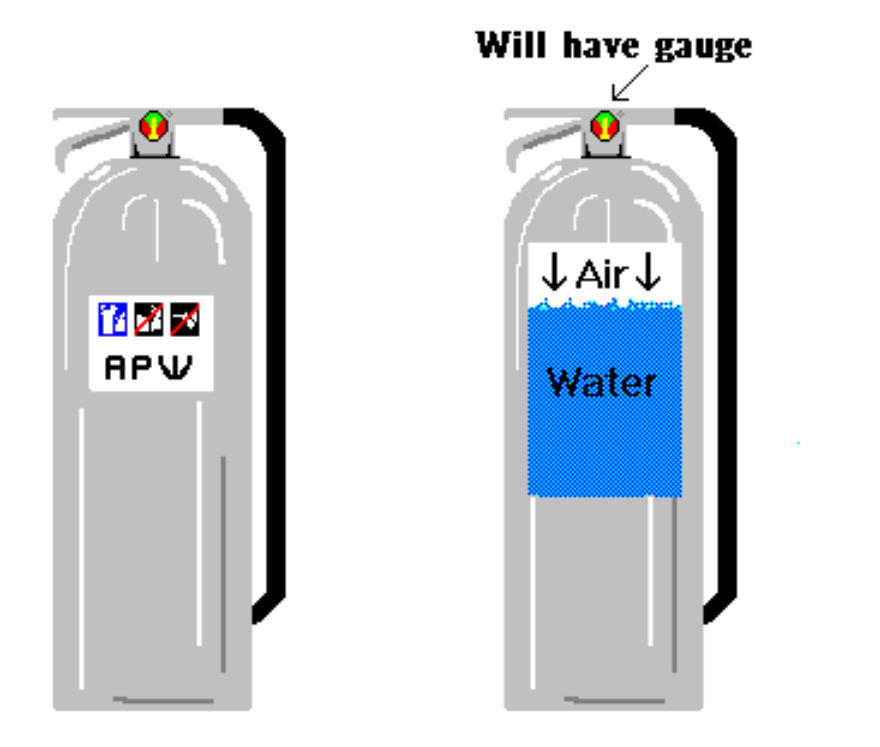
Different types of fire extinguishers are designed to fight different classes of fire.

The 3 most common types of fire extinguishers are:

1. Water (APW)
2. Carbon Dioxide (CO_2)
3. Dry Chemical (ABC, BC, DC)

Types of Fire Extinguishers

1. Water (APW) Fire Extinguishers



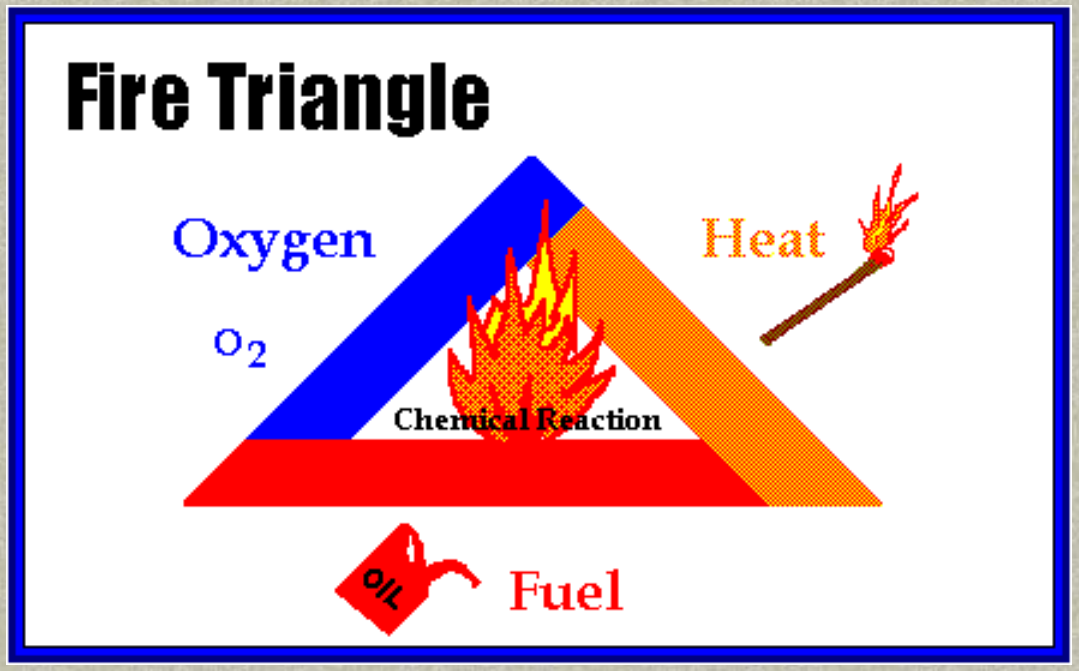
Large silver fire extinguishers that stand about 2 feet tall and weigh about 25 pounds when full.

APW stands for "Air-Pressurized Water."

Filled with ordinary tap water and pressurized air, they are essentially large squirt guns.

Types of Fire Extinguishers

1. Water (APW) Fire Extinguishers



APW's extinguish fire by taking away the "heat" element of the Fire Triangle.

Types of Fire Extinguishers

1. Water (APW) Fire Extinguishers

APW's are designed for Class A fires **only**: Wood, paper, cloth.

- Using water on a flammable liquid fire could cause the fire to spread.
- Using water on an electrical fire increases the risk of electrocution. If you have no choice but to use an APW on an electrical fire, make sure the electrical equipment is un-plugged or de-energized.

Types of Fire Extinguishers

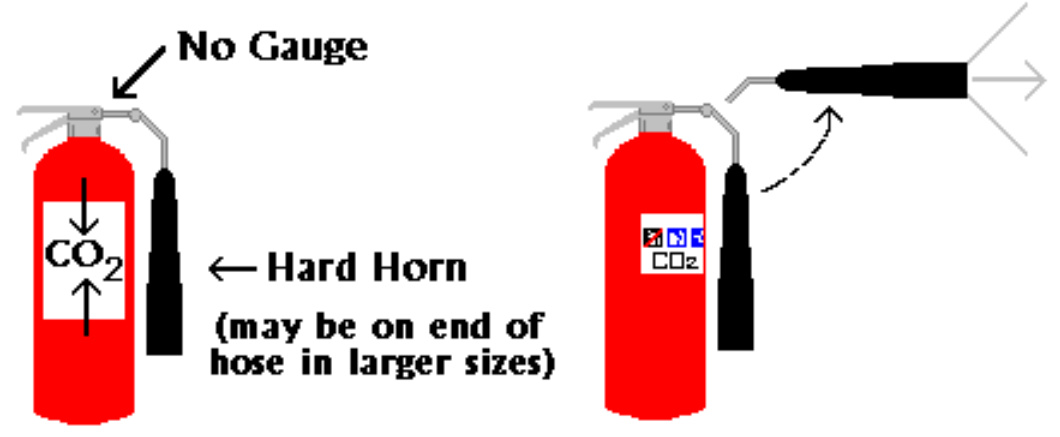
1. Water (APW) Fire Extinguishers

APWs will be found in older buildings, particularly in public hallways, as well as in Residence Halls.

They will also be found in computer laboratories. It is important to remember, however, that computer equipment must be disconnected from its electrical source before using a water extinguisher on it.

Types of Fire Extinguishers

2. Carbon Dioxide Fire Extinguishers



The pressure in a CO_2 extinguisher is so great, bits of dry ice may shoot out of the horn!

CO_2 cylinders are red. They range in size from 5 lbs to 100 lbs or larger. On larger sizes, the horn will be at the end of a long, flexible hose.

Types of Fire Extinguishers

2. Carbon Dioxide Fire Extinguishers

CO_2's are designed for Class B and C (Flammable Liquids and Electrical Sources) fires only!

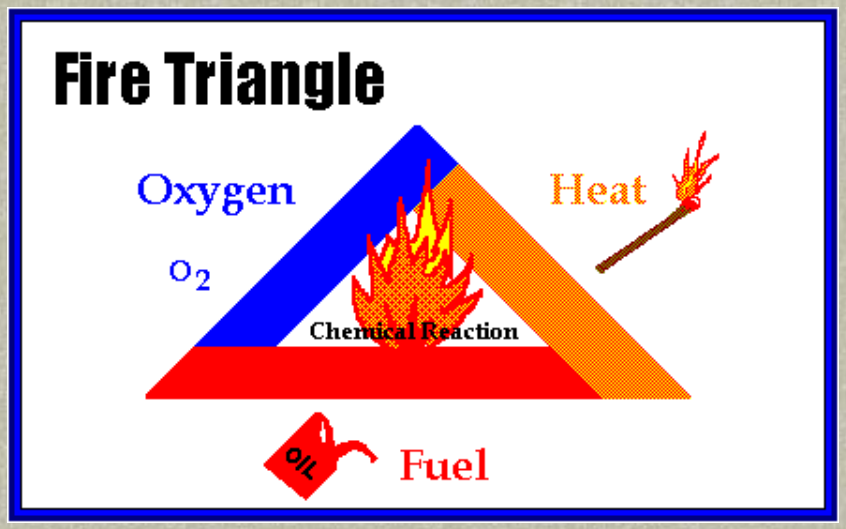
CO_2s will frequently be found in laboratories, mechanical rooms, kitchens, and flammable liquid storage areas.

In accordance with NFPA regulations (and manufacturers' recommendations), all CO_2 extinguishers at OSU undergo hydrostatic testing and recharge every 5 years.

Types of Fire Extinguishers

2. Carbon Dioxide Fire Extinguishers

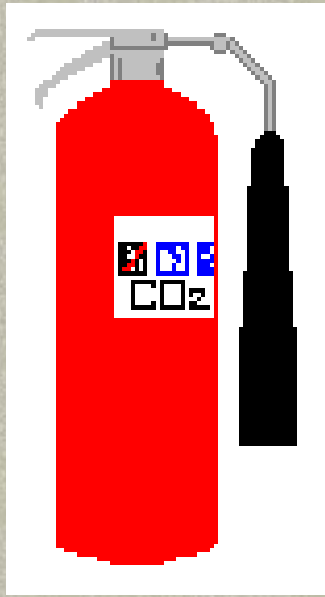
Carbon dioxide is a non-flammable gas that takes away the oxygen element of the fire triangle. Without oxygen, there is no fire.



CO_2 is very cold as it comes out of the extinguisher, so it cools the fuel as well.

Types of Fire Extinguishers

2. Carbon Dioxide Fire Extinguishers

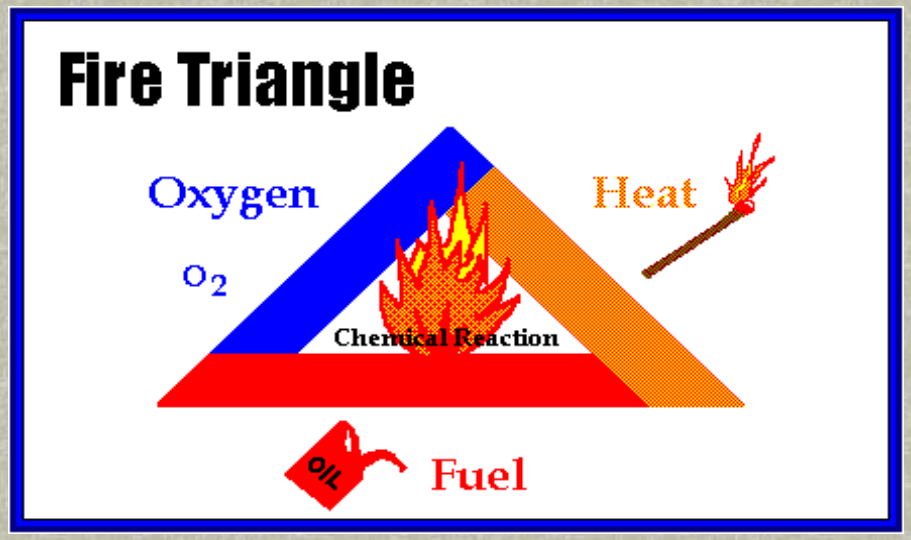


A CO_2 may be ineffective in extinguishing a Class A fire because it may not be able to displace enough oxygen to successfully put the fire out.

Class A materials may also smolder and re-ignite.

Types of Fire Extinguishers

3. Dry Chemical (ABC) Fire Extinguishers

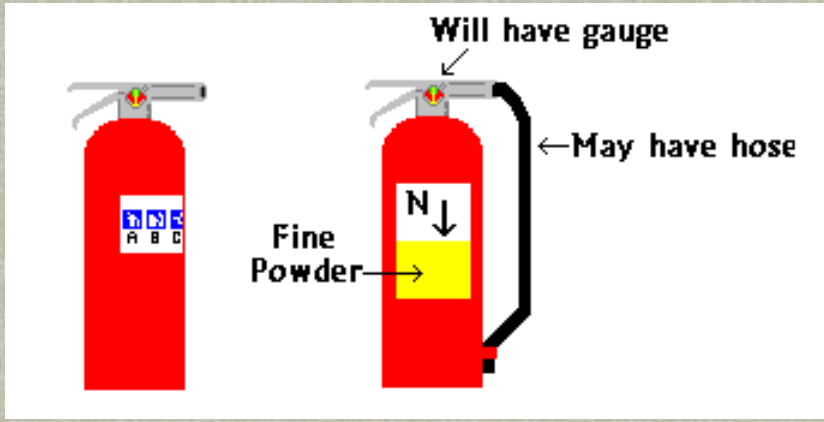


Dry chemical extinguishers put out fire by coating the fuel with a thin layer of dust. This separates the fuel from the oxygen in the air.

The powder also works to interrupt the chemical reaction of fire. These extinguishers are very effective at putting out fire.

Types of Fire Extinguishers

3. Dry Chemical (ABC) Fire Extinguishers

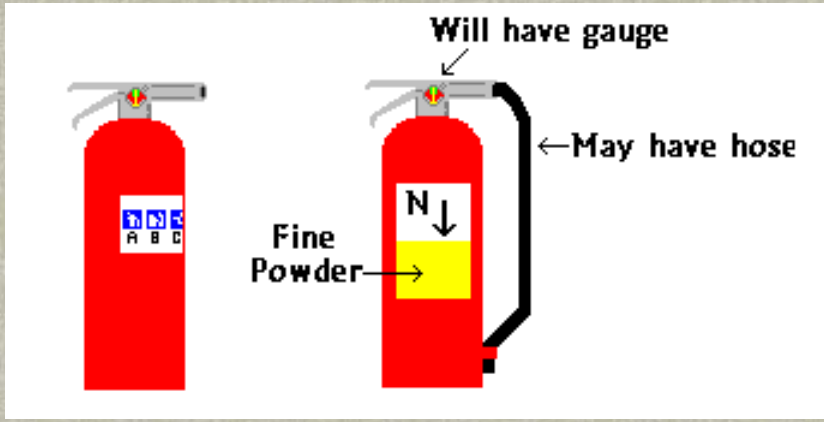


ABC extinguishers are red. On campus, they range in size from 5 to 20 lbs.

At OSU, "ABC" fire extinguishers are filled with a fine yellow powder. The greatest portion of this powder is composed of monoammonium phosphate. The extinguishers are pressurized with nitrogen.

Types of Fire Extinguishers

3. Dry Chemical (ABC) Fire Extinguishers



Dry chemical extinguishers come in a variety of types…

You may see them labeled:

- DC (for "Dry Chemical")
- ABC (can be used on Class A, B, or C fires)
- BC (designed for use on Class B and C fires)

Types of Fire Extinguishers

3. Dry Chemical (ABC) Fire Extinguishers

It is extremely important to identify which types of dry chemical extinguishers are located in your area!

An “ABC” extinguisher will have a label like this, indicating it may be used on Class A, B and C fires.

You don’t want to mistakenly use a “BC” extinguisher on a Class A fire thinking that it was an “ABC” extinguisher.

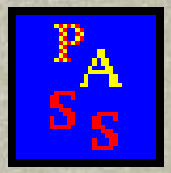
Types of Fire Extinguishers

3. Dry Chemical (ABC) Fire Extinguishers

Dry chemical extinguishers with powder designed for Class B and C fires ("BC" extinguishers) may be located in places such as commercial kitchens and areas with flammable liquids.

On campus, you will find ABC's in public hallways of new buildings, in laboratories, break rooms, offices, chemical storage areas, mechanical rooms, University vehicles, etc.

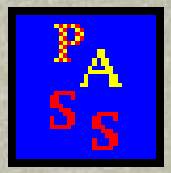
How to Use a Fire Extinguisher



It's easy to remember how to use a fire extinguisher if you remember the acronym **PASS**:

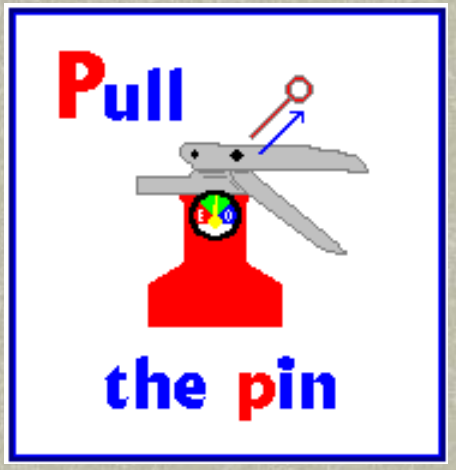
- **P**ull
- **A**im
- **S**queeze
- **S**weep

How to Use a Fire Extinguisher

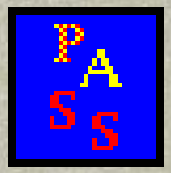


Pull the pin...

This will allow you to discharge the extinguisher



How to Use a Fire Extinguisher



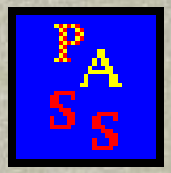
Aim at the base of the fire…

Hit the fuel.

If you aim at the flames…

… the extinguishing agent will fly right through and do no good.

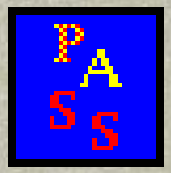
How to Use a Fire Extinguisher



Squeeze the top handle...

This depresses a button that releases the pressurized extinguishing agent.

How to Use a Fire Extinguisher



Sweep from side to side...

.. until the fire is completely out.

Start using the extinguisher from a safe distance away, then slowly move forward.

Once the fire is out, keep an eye on the area in case it re-ignites.

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. Assist any person in immediate danger to safety, if it can be accomplished without risk to yourself.
2. Call 911 or activate the building fire alarm. The fire alarm will notify the fire department and other building occupants and shut off the air handling system to prevent the spread of smoke.

If the fire is small (and Only after having done these 2 things), you may attempt to use an extinguisher to put it out. **However . . . .**

Rules for Fighting Fires

. . . before deciding to fight the fire, keep these things in mind:

1. **Know what is burning.** If you don't know what's burning, you won't know what kind of extinguisher to use.
2. Even if you have an ABC fire extinguisher, there may be something in the fire that is going to explode or produce toxic fumes.

Chances are you *will* know what's burning, or at least have a pretty good idea, but if you don't, let the fire department handle it.

Rules for Fighting Fires

. . . before deciding to fight the fire, keep these things in mind:

3. **Is the fire spreading** rapidly beyond the point where it started? The time to use an extinguisher is at the beginning stages of the fire.
4. If the fire is already spreading quickly, it is best to simply evacuate the building.

As you evacuate a building, close doors and windows behind you as you leave. This will help to slow the spread of smoke and fire.

Rules for Fighting Fires

Do not fight the fire if:

- ✓ **You don't have adequate or appropriate equipment.** If you don't have the correct type or large enough extinguisher, it is best not to try fighting the fire.
- ✓ **You might inhale toxic smoke.** When synthetic materials such as the nylon in carpeting or foam padding in a sofa burn, they can produce hydrogen cyanide, acrolein, and ammonia in addition to carbon monoxide. These gases can be fatal in very small amounts.
- ✓ **Your instincts tell you not to.** If you are uncomfortable with the situation for any reason, just let the fire department do their job.

Rules for Fighting Fires

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. You don't want to become trapped.