# MAJOR PROGRAM POINTS

# "USING FIRE EXTINGUISHERS SAFELY"

**Part of the "GENERAL SAFETY SERIES"**

**Quality Safety and Health Products, for Today...and Tomorrow**

# Outline of Major Points Covered in the "Using Fire Extinguishers" Course

The following outline summarizes the major points of information presented in the course on "Using Fire Extinguishers". The outline can be used to survey the course before taking it on a computer, as well as to review the course when a computer is not available.

- **A bin of oil-soaked rags ignites… but an employee extinguishes the fire.**
  - A copier's wiring begins to burn, but is quickly contained.
  - A deep fryer bursts into flames, but the chef is able to extinguish the blaze.

- **Portable fire extinguishers provide a handy and reliable way to put out small fires before they get out of control.**
  - But to be safe, you need to know how and when to use them.

- **Fires can break out anywhere, at any time.**

- **OSHA regulations, state ordinances and local fire codes require industrial facilities, office complexes and public buildings to have portable fire extinguishers located near all potential fire hazards.**
  - The Department of Transportation requires that all commercial vehicles be equipped with extinguishers, as well.

- **Extinguishers should be mounted on hangers or in marked fire extinguisher cabinets, where they can be clearly seen.**
  - Never store an extinguisher on the floor, in a closet, or behind furniture, plants or decorations.
  - When a fire starts there is no time to search for an extinguisher that works.
  - They must be within easy reach and ready to go!

- **Fire extinguisher inspections and maintenance should be a major part of your facility's fire prevention policy.**
  - Check extinguishers at least once a month to make sure that they are in good shape.
  - Look them over weekly if they are located outdoors.

- **When examining an extinguisher, make sure that:**
  - The pressure gauge shows that it is fully charged.
  - The locking pin and plastic "tamper seal" are in place.
  - The hose and horn are unobstructed and in good shape.
  - The metal parts are free of corrosion.

- **Never test an extinguisher to see if it is working.**
  - Once the valve has been opened the extinguisher will lose pressure, and may empty completely within a few days.

- **You should also check the service tag to see when the extinguisher is due for a professional inspection. Fire codes require that extinguishers:**
  - Are inspected by an authorized service technician annually.
  - Have their cylinders pressure-tested at least every 12 years (some types of extinguishers must be pressure-tested every 5 years.).

- **Fire extinguishers are designed to put out small fires before they grow out of control.**
  - But putting out fires with an extinguisher is not always easy, and it can be dangerous if you don't know what you're doing.

- **To use an extinguisher effectively it's helpful to know what causes things to burn.**
  - Fires start with heat, which is the "source of ignition."
  - Heat can be generated by many things, including open flames, chemical reactions, faulty electrical circuits and overheated equipment.

- **Once a fire is burning, it produces more heat and grows even larger.**
  - As long as there is enough fuel and oxygen, a fire will continue to spread.

- **Fuel can include combustible solids like paper, wood and some metals, flammable liquids and ignitable gases.**

- **It's the vapors coming off of a substance, mixed with oxygen in the air, that burn.**
  - Some materials are always giving off flammable vapors, while others have to be heated for vapors to appear.

- **For example, you have to apply heat to get wood to burn.**
  - The heat causes the wood to decompose, creating ash and flammable vapors.
  - The vapors then mix with oxygen and ignite.

- **Since fire is a "chain reaction" between heat, fuel and oxygen, a fire will continue to burn until the heat is removed, the fuel is used up or the oxygen runs out.**
  - Fire extinguishers work by applying substances that interrupt the "chain reaction," either cooling a fire, depriving it of oxygen, or both.

- **There are many different types of substances that are used to extinguish fires. The most common include:**
  - Dry chemicals.
  - Carbon dioxide.
  - Foam.
  - Water.

- **To extinguish a fire you must apply an extinguishing agent that is compatible with the materials that are burning.**
  - Using the wrong agent can be dangerous!

- **For example, water works well for putting out fires that consist of burning paper or wood, but it can cause burning liquids to spread.**
  - Water also conducts electricity, so it should not be used where live wires or energized electrical equipment is located, either.

- **Fires have traditionally been separated into four "classes," to help identify what agents can be used to extinguish them:**
  - Class A.
  - Class B.
  - Class C.
  - Class D.

- **Class "A" fires are fueled by "ordinary" combustible materials, such as paper, cardboard and wood.**
  - Water, foam and some dry chemical agents can all be used to extinguish Class A fires.
  - Water works by cooling the fire, while foams and dry chemicals cut off its supply of oxygen.

- **Class "B" fires are fueled by ignitable gases and liquids, such as gasoline and propane.**
  - Dry chemical, foam and carbon dioxide extinguishers are used on these fires.

- **Class "C" fires involve "live" electrical hazards.**
  - Most extinguishers that are safe to use on Class C fires are filled with nonconductive extinguishing agents, which helps to prevent electrocution.
  - However, to be completely safe you should cut the power before attempting to tackle the fire.

- **Class "D" fires are fueled by combustible metals such as potassium, sodium and magnesium.**
  - These fires are extremely dangerous and require Class D fire extinguishers to put them out.

- **In addition to these four classes of fires, the National Fire Protection Association (NFPA) has created a separate classification for commercial kitchen fires, Class "K."**
  - Class K fire extinguishers contain agents that are formulated to be especially effective on fires involving extremely hot saturated fats and oils.

- **You can tell what classes of fire an extinguisher can be used with by looking at its label. Extinguishers may be marked in two ways.**
  - Some extinguishers use simple colored shapes and "fire class" letters.
  - But "pictographs" are used on most new extinguishers.

- **These easy-to-understand symbols include a:**
  - Burning wastebasket and campfire to represent Class A fires.
  - Flaming gasoline container for Class B.
  - Burning electric plug and receptacle for Class C fires.
  - Fire in a frying pan for Class K.
  - (If a pictograph is crossed out with a red line, it indicates that the extinguisher is not suitable for that class of fire.)

- **There is no pictograph for Class D fires.**
  - These fire extinguishers are always marked with yellow five-pointed stars containing the letter "D."

- **You can also get a good idea of how big a fire an extinguisher can put out from its label.**

- **Extinguishers that are suitable for Class A fires have a rating from 1-A to 40-A.**
  - The higher the number, the more extinguishing agent they hold.
  -
- **Class B and BC fire extinguishers are rated from 1-B to 640-B, based on how many square feet of burning flammable liquid they are capable of putting out.**

- **AB and ABC extinguishers will have both types of ratings on them.**

- **The fire extinguishers in your facility should be appropriate for the hazards that are present.**
  - For example, a work area that contains wooden materials, flammable liquids and electrical machinery should have extinguishers that are rated for Class A, B and C fires.

- **Multi-purpose dry chemical ABC fire extinguishers are by far the most popular type of extinguisher in use today.**
  - These extinguishers contain monoammonium phosphate, which smothers a fire by "coating" the fuel.

- **Because ABC fire extinguishers can be used on all of the most common classes of fires, they are good for "general" locations, such as homes, hospitals, schools, offices and small industrial facilities.**
  - However, multi-purpose dry chemical extinguishers are not the best choice for all situations, since they leave behind a mildly corrosive residue that can be difficult to clean up.

- **Regular dry chemical extinguishers are a good choice for vehicles and home kitchens.**
  - These extinguishers use sodium bicarbonate (baking soda), which is non-corrosive, easy to sweep up and highly effective on class B and C fires.

- **Baking soda fights fires in two ways.**
  - The heat from the fire causes the baking soda to decompose and release carbon dioxide gas, which displaces oxygen and smothers the fire.
  - The residue that is left behind keeps the fire from reigniting, by forming a barrier between the fuel and the oxygen.

- **Carbon Dioxide ($CO_2$) extinguishers are rated for Class B and C fires as well.**
  - The carbon dioxide pushes oxygen away from the fuel.
  - But since the $CO_2$ quickly disperses in the atmosphere, the blaze can easily reignite if it is not completely extinguished.

- **The advantage of $CO_2$ is that it doesn't leave any residue behind.**
  - This makes these extinguishers good for use in computer rooms and other areas that contain expensive electronic equipment.

- **Foam fire extinguishes are usually rated for Class A and Class B fires.**
  - The foam must be applied carefully, so that it forms a "blanket" over the burning materials, to cut off the fire's oxygen supply.

- **Foam is extremely effective on burning flammable liquids, and can also be used on a spill to prevent it from igniting.**
  - This makes foam extinguishers good for use in commercial garages and chemical storage facilities.

- **When a building is burning, firefighters will usually use water or water-based foam to try and put it out.**
  - Water is one of the quickest and most effective ways to extinguish Class A fires.

- **Air-pressurized water extinguishers were once very common, but since they can only be used on Class A fires most of them have been replaced by multi-purpose dry chemical ABC fire extinguishers.**
  - But since dry chemicals are not as effective on Class A materials, some facilities still use water extinguishers.

- **Dry chemicals can't reach burning embers within a stack of paper, piece of wood, pile of sawdust or a mattress… but water can soak these materials and prevent a fire from reigniting.**
  - However, you must be careful not to use an air-pressurized water extinguisher in the vicinity of live electrical equipment, since these extinguishers are rated for Class A fires only.

- **Water-mist extinguishers, on the other hand, are rated for Class A <u>and</u> Class C fires.**
  - These extinguishers have nozzles that spray water in fine droplets.
  - This makes them safer to use around electrical equipment, because there is not a continuous stream of water for the electricity to follow.
  - This makes water-mist extinguishers ideal for hospitals, nursing homes, libraries, document storage centers and other areas that contain both combustibles and low voltage electrical hazards.

- **In addition to the extinguishers that are used to handle Class A, B and C fires, there are also extinguishers that can only be used on Class D fires, as well as extinguishers that are specifically designed to handle Class K fires.**
  - The important thing is that you know what types of fires can occur at your facility, and which extinguishers to use to put them out.

- **To be able to extinguish a fire you have to act quickly.**
  - But before trying to tackling a blaze you must make sure that no one is in danger, and the fire department has been notified.

- **Your safety is important too!**
  - So if at any time you feel that the situation is too dangerous, evacuate.

- **Whether you choose to fight a fire or not, it is critical to close nearby doors and windows.**
  - This limits the amount of oxygen available to the fire and helps to keep it from growing.

- **If the fire is behind a closed door, don't open it!**
  - This will feed oxygen to the fire, and make the situation much worse.

- **Smoke inhalation kills more people than flames, so be aware.**
  - Many common materials, including plastic, wool and flammable liquids, produce toxic smoke when they burn, which can kill you in a couple of breaths.

- **The size and location of a fire can also make it unsafe to fight. You won't be able to put out a fire if it:**
  - Is too large for the extinguisher that you have.
  - Has spread into areas the extinguisher can't easily reach, such as ceilings or walls.

- **If you feel that it's safe to try and extinguish a fire, approach it carefully, with your back to an exit.**
  - A fire can double in size in seconds, so always make sure that you have a quick escape route.

- **Before using an extinguisher double-check that it's correct for the materials that are burning.**

- **Position yourself within the extinguisher's "effective range."**
  - The effective range can be found on the extinguisher's label.
  - Many dry chemical ABC fire extinguishers require you to stand about 6 to 8 feet from the fire.

- **Make sure that you hold the extinguisher upright, then use the P.A.S.S. method to put the fire out:**
  - Pull the extinguisher's pin.
  - Aim the nozzle at the base of the fire.
  - Squeeze the trigger.
  - Sweep from side to side, with a slow, steady motion.

- **Remember, extinguishing agents put fires out by either cooling the burning material, depriving it of oxygen, or both, so:**
  - Keep the nozzle pointed at the base of the fire.
  - Make sure that you hit the fuel, not just the flames.

- **If you are dealing with flammable liquids, be careful not to "splash" the spill.**
  - This will spread the fire and make the situation worse.

- **As the fire gets smaller, step forward to stay within the extinguisher's "effective range."**
  - Be careful where you walk, you don't want to get any flammable material on your shoes or clothing.

- **Continue to use the extinguisher until it empties completely. The size and type of the extinguisher determines how long it will last.**
  - A small dry chemical extinguisher may be used in as little as 10 to 15 seconds.

- **As you apply an extinguishing agent a tremendous amount of smoke can develop, so you need to know your escape route "blindfolded."**
  - Get close to the ground if the smoke is making it hard to see, or breathe.

- **Once the extinguisher is empty, you need to get to safety.**
  - Even if the fire appears to have been extinguished, smoke and the possibility that the fire may reignite makes it dangerous to stay.

- **As you evacuate, place the extinguisher on its side, in an out-of-the-way area, so no one will trip over it.**

- **Using a fire extinguisher may seem pretty straightforward.**
  - But in an emergency it can be more difficult than you might think.

- **To be truly prepared, it's good to have some "real life" experience.**
  - Contact your local fire department and ask them if they offer hands-on fire extinguisher training.

***** <u>SUMMARY</u> *****

- **The best way to fight fires is to prevent them.**
  - But fires can break out anywhere, at any time, so you need know how and when to use fire extinguishers.

- **Know what classes of fires might occur at your facility and which extinguishers you can use to fight them.**

- **Make sure that extinguishers are mounted in plain sight, checked regularly and inspected annually.**

- **Sound the alarm and call 911 before trying to tackle a blaze.**

- **Always have an escape plan, and get out if the situation becomes too dangerous.**

- **Remember the P.A.S.S. method.**

- **Talk to your local fire department about getting hands-on experience with extinguishers.**

- **Firefighting is probably not in your job description. But with the proper training and the right extinguisher, you can prevent a catastrophe by keeping a small fire from growing into a raging inferno!**