

Portable Fire Extinguishers

Effective fire extinguisher use requires training and a basic knowledge of fire extinguishers and fire types. To be effective one must use the right size and type of fire extinguisher for the fire on hand. Once a fire is underway, it is too late to search for the appropriate size and type of extinguisher. The choice of extinguisher and the placement of that extinguisher must be done before a fire event. Fire extinguisher selections and placements are usually governed by OSHA and NFPA guidelines. Because environments may change, property owners should review the selection and placement of all extinguishers at least annually, or more often if there are changes in the use and fire loading of areas within the facilities.

1. Fire extinguishers are classified for the types of fire on which they may be used by a letter system (A, B, C, D), which is related to the extinguishing agent within the extinguisher. Extinguishers are also given a numeric value to denote extinguisher capacity. For example, an extinguisher might be labeled 2-A, 20-B, or carry a multipurpose rating such as 3-A: 40-B: C – there are many grades. The higher the numeric value, the larger the fire the unit is designed to extinguish. It is very important to use the correct extinguisher for the type of fuel. ***Using the incorrect extinguishing agent can be dangerous, ineffective, or allow the fire to reignite.***

Fire Extinguisher Classifications are as follows:

- **Class A:** For use with ordinary combustibles, such as wood, trash, textiles, paper, cardboard, rubber, and many plastics. Class A fires are extinguished by the cooling action of water or water-based agents or by the insulating and fusing action of general purpose dry chemical or foam agents.
- **Class B:** For use with combustible and flammable liquids – such as gasoline, oil, tar, grease, alcohol, diesel and home heating oils, lacquers, and oil-based paints – and flammable gasses.
- **Class C:** For use with energized electrical equipment. An extinguisher intended for electrical fires will always bear a dual classification, e.g., B:C or A:B:C, because the extinguishing agent must be compatible with the material that is burning – electricity itself is not a fuel and does not burn. Because of the electrical shock hazard, fires that involve live electrical components or wiring should be extinguished by a non-conductor of electricity, such as CO₂ or a general purpose dry chemical. Never use water on an electrical fire unless the power is cut-off, in which case a Class A, B, or D extinguisher may be used, depending on the combustible material.
- **Class D:** For use with combustible metals such as magnesium, zirconium, sodium, potassium, lithium, uranium, powdered aluminum, and titanium. Class D fires are extinguished by a special powder (specific to that metal) that seals the burning surface and smothers the fire.
- **Class K:** For use with cooking oils and grease fires – animal or vegetable fats – that are typically extinguished by cooling, shutting off the air supply, and smothering the blaze.

2. There are eight types of fire extinguishers. They are as follows:

- **Water & Foam** (AFFF foam and FFFP foam) fire extinguishers douse the fire by taking away the heat element. Foam agents also separate oxygen from the fuel. Water extinguishers may be used only for Class A fires. Foam extinguishers may be used on Class A and Class B fires. Stored water extinguishers offer extended distance and duration.
- **Carbon Dioxide (CO₂)** fire extinguishers snuff out the fire by taking away the oxygen element and by removing the heat with a very cold discharge. Carbon dioxide can be used on Class B & C fires and leaves no residue – important for sensitive equipment.
- **Dry Chemical** fire extinguishers put out the fire primarily by interrupting the chemical reaction. Today's most widely used extinguishing agent is a multipurpose dry chemical (e.g., ammonium phosphate) that is effective on Class A, B and C fires. Ordinary dry chemical agents (e.g., sodium bicarbonate or potassium bicarbonate) are for Class B & C fires only.
- **Wet Chemical** is a new agent (a low PH, potassium acetate based agent) that extinguishes the fire by removing the heat and prevents re-ignition by creating a barrier between the oxygen supply and the fuel for the fire. Wet chemical or Class K extinguishers are developed for modern, commercial high efficiency deep-fat fryers.
- **Clean Agent or Halogenated** extinguishers include halon extinguishing agents (such as chlorine, fluorine, and bromine) as well as the newer and less ozone-depleting halocarbon agents. They extinguish fires by interrupting the chemical reaction, cooling, and smothering. Clean agent extinguishers are primarily for Class B & C fires, but can be used on Class A fires as well.
- **Dry Powder** extinguishers are similar to dry chemical agents except that they extinguish the fire by separating the fuel from the oxygen supply. Dry powder extinguishers are for Class D combustible metal fires only. They are ineffective on all other classes of fire.
- **Water Mist** extinguishers are primarily for Class A fires, but they are also safe for use on Class C fires. These extinguishers quench a fire by taking away the heat element. They are an alternative to clean agent extinguishers where contamination is a concern, such as in healthcare and high tech facilities.
- **Cartridge Operated Dry Chemical** is effective on Class A, B and C fires. These fire extinguishers put out a fire primarily by interrupting the chemical reaction of the fire. The agent also works by creating a barrier between the oxygen supply and the fuel in Class A fires.

3. Fire extinguishers should be located so as to provide easy accessibility. They should be placed near normal paths of travel or near entrance and exit doors, and should be protected from damage. They should not be placed where they could be blocked. Fire extinguishers should be readily visible. They should be wall mounted about 3.5 feet above the floor where they can be easily removed from supporting brackets.

4. All fires can be very dangerous and life-threatening. Personal safety should always be the primary concern when attempting to fight a fire. Call the local fire department before attempting to fight the fire with an extinguisher. **Before attacking a fire:**
- Make sure you have the proper fire extinguisher for what is burning.
 - Be certain that the fire is incipient, that is, small and not spreading rapidly. Fires can double in size in seconds or minutes.
 - Stand several feet away from the fire, moving closer once the fire starts to diminish.
 - Always stand with an exit at your back.
 - Use a sweeping motion and aim at the base of the fire and work the agent into the fire.
 - Be sure to watch the area for at least fifteen minutes after the fire appears to be out to be sure it doesn't re-ignite. If it is smoking, it is not out.
 - If possible use a "buddy system," that is, have someone back you up or to call for help if something goes wrong. Exit the immediate area facing the fire or fire-affected area.

Fire Extinguisher Maintenance and Inspection:

- Fire extinguishers should be maintained in the best possible condition at all times. They should be inspected at least annually by qualified personnel.
- There should be a tag listing the date of inspection or service on the extinguisher.
- Many establishments require a monthly or quarterly visual check of each extinguisher. Ensure that the pressure is at the recommended level. On extinguishers equipped with a gauge, the needle should be in the green zone – not too high and not too low.
- Make sure the nozzle or other parts are not hindered in any way and that the pin and tamper seal are intact. Also make sure there are no dents, leaks, rust, chemical deposits, or other signs of abuse or wear.
- To be effective, occupants need to be aware of where the extinguishers are located, what the label codes mean, and how to use each type of extinguisher on the premises. As many occupants as possible should receive hands-on training. Your local fire department may offer training. The fire extinguisher inspection and charging company may also offer hands-on training.

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