

With so many fire extinguishers to choose from, selecting the proper one for your home can be a daunting task. Everyone should have at least one fire extinguisher at home, but it's just as important to ensure you have the proper type of fire extinguisher. Fire protection experts recommend one for the kitchen, the garage and workshop.

Fire extinguishers are divided into four categories, based on different types of fires. Each fire extinguisher also has a numerical rating that serves as a guide for the amount of fire the extinguisher can handle. The higher the number, the more fire-fighting power. The following is a quick guide to help choose the right type of extinguisher.



- **Class A** extinguishers are for ordinary combustibles such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish.
- **Class B** fires involve flammable or combustible liquids such as gasoline, kerosene, grease and oil. The numerical rating for class B extinguishers indicates the approximate number of square feet of fire it can extinguish.
- **Class C** fires involve electrical equipment, such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish class C fires - the risk of electrical shock is far too great! Class C extinguishers do not have a numerical rating. The C classification means the extinguishing agent is non-conductive.
- **Class D** fire extinguishers are commonly found in a chemical laboratory. They are for fires that involve combustible metals, such as magnesium, titanium, potassium and sodium. These types of extinguishers also have no numerical rating, nor are they given a multi-purpose rating - they are designed for class D fires only.

Some fires may involve a combination of these classifications. Your fire extinguishers should have ABC ratings on them.

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Here are the **most common types of fire extinguishers**:



- **Water extinguishers** or APW extinguishers (air-pressurized water) are suitable for **class A fires only**. Never use a water extinguisher on grease fires, electrical fires or class D fires - the flames will spread and make the fire bigger! Water extinguishers are filled with water and pressurized with oxygen. Again - water extinguishers can be very dangerous in the wrong type of situation. Only fight the fire if you're certain it contains ordinary combustible materials only.
- **Dry chemical** extinguishers come in a variety of types and are suitable for a combination of **class A, B and C fires**. These are filled with foam or powder and pressurized with nitrogen.
 - **BC** - This is the regular type of dry chemical extinguisher. It is filled with sodium bicarbonate or potassium bicarbonate. The BC variety leaves a mildly corrosive residue which must be cleaned immediately to prevent any damage to materials.
 - **ABC** - This is the multipurpose dry chemical extinguisher. The ABC type is filled with monoammonium phosphate, a yellow powder that leaves a sticky residue that may be damaging to electrical appliances such as a computer

Dry chemical extinguishers have an advantage over CO₂ extinguishers since they leave a non-flammable substance on the extinguished material, reducing the likelihood of re-ignition.

- **Carbon Dioxide (CO₂) extinguishers** are used for **class B and C fires**. CO₂ extinguishers contain carbon dioxide, a non-flammable gas, and are highly pressurized. The pressure is so great that it is not uncommon for bits of dry ice to shoot out the nozzle. They don't work very well on class A fires because they may not be able to displace enough oxygen to put the fire out, causing it to re-ignite.

CO₂ extinguishers have an advantage over dry chemical extinguishers since they don't leave a harmful residue - a good choice for an electrical fire on a computer or other favorite electronic device such as a stereo or TV.

It is vital to know what type of extinguisher you are using. Using the wrong type of extinguisher for the wrong type of fire can be life-threatening.

These are only the common types of fire extinguishers. There are many others to choose from. Base your selection on the classification and the extinguisher's compatibility with the items you wish to protect.

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When selecting the appropriate type of fire extinguisher, it is important to think about extinguishing agents. Each class of fire is best fought by a specific extinguishing agent. You will find a color-coded box on your fire extinguisher identifying which classes of fire it can be used for, and the type of fire extinguishing agent it contains.

Multi-Purpose Dry Chemical (A, B, C)

A dry chemical agent called mono ammonium phosphate. The chemical is non-conductive and can be mildly corrosive if moisture is present. In order to avoid corrosion, it is necessary to scrub and thoroughly cleanup the contacted area once the fire is out. A dry chemical fire extinguisher is usually used in schools, general offices, hospitals, homes, etc.

Regular Dry Chemical (B, C)

A dry chemical agent called sodium bicarbonate. It is non-toxic, non-conductive and non-corrosive. It is easy to cleanup, requiring only vacuuming, sweeping or flushing with water. Extinguishers with sodium bicarbonate are usually used in residential kitchens, laboratories, garages, etc.

Carbon Dioxide (B, C)

Carbon dioxide removes oxygen to stop a fire but has limited range. It is environmentally friendly and leaves no residue, so cleanup is unnecessary. Extinguishers with carbon dioxide are usually used in contamination-sensitive places such as computer rooms, labs, food storage areas, processing plants, etc.

Halotron (A, B, C)

A vaporizing liquid that is ozone friendly and leaves no residue. Because it requires no cleanup, fire extinguishers with halotron are ideal for computer rooms, telecommunication areas, theaters, etc.

Foam (A, B)

Foam floats on flammable liquids to tame the fire and helps prevent reflashes. To cleanup the affected area, it must be washed away and left to evaporate. Fire extinguishers with foam are usually used in garages, homes, vehicles, workshops, etc.

Purple K Dry Chemical (B, C)

A dry chemical called potassium bicarbonate. It is non-conductive and non-corrosive. Clean up requires vacuuming, sweeping or flushing with water. Extinguishers with potassium bicarbonate are usually used in military facilities, oil companies, vehicles, etc.

Water (A)

The most common agent is water; however, it cannot be used for class B or C fires because it is conductive. Water-based fire extinguishers are usually used in stockrooms, schools, offices, etc.

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| Fuel Source | Class of Fire | Type of Extinguisher (Extinguishing Agent) |
|--|----------------------|--|
| Ordinary combustibles (e.g. trash, wood, paper, cloth) | A | Water; chemical foam; dry chemical* |
| Flammable liquids (e.g. oils, grease, tar, gasoline, paints, thinners) | B | Carbon dioxide (CO ₂); halon**; dry chemical; aqueous film forming foam (AFFF) |
| Electricity (e.g. live electrical equipment) | C | CO ₂ ; halon; dry chemical |
| Combustible metals (e.g. magnesium, titanium) | D | Dry powder (suitable for the specific combustible metal involved) |

* Dry chemicals, CO₂ and halon can be used on Class A fires, but may not be effective on their own. They need to be supplemented with water.

** Halon extinguishers are no longer made but some may still be in use. Dangerous gases are formed when halon is used to put out fires. Wear proper respiratory equipment, particularly in enclosed spaces. After use, do not allow anyone to enter the area until it has been well ventilated.

How a Fire Extinguisher Works

Fire needs fuel, oxygen and heat in order to burn. In simple terms, fire extinguishers remove one of these elements by applying an agent that either cools the burning fuel, or removes or displaces the surrounding oxygen.

Fire extinguishers are filled with water or a smothering material, such as CO₂. By pulling out the safety pin and depressing the lever at the top of the cylinder (the body of the extinguisher), this material is released by high amounts of pressure.

How it Works

At the top of the cylinder, there is a smaller cylinder filled with compressed gas. A release valve acts as a locking mechanism and prevents this gas from escaping. When you pull the safety pin and squeeze the lever, the lever pushes on an actuating rod which presses the valve down to open a passage to the nozzle. The compressed gas is released, applying a downward pressure on the fire-extinguishing material. This pushes the material out the nozzle with high amounts of pressure. Although the temptation is to aim the extinguisher at the flames, the proper way to use the extinguisher is to aim it directly at the fuel.

Water Extinguishers

Water extinguishers are filled with regular tap water and pressurized with oxygen. The best way to remove heat is to dump water on the fire but, depending on the type of fire, this is not always the best option.

Dry Chemical Extinguishers

Dry chemical extinguishers are filled with either foam or powder, usually sodium bicarbonate (baking soda) or potassium bicarbonate, and pressurized with nitrogen. Baking soda is effective because it decomposes at 158 degrees Fahrenheit and releases carbon dioxide (which smothers oxygen) once it decomposes. Dry chemical extinguishers interrupt the chemical reaction of the fire by coating the fuel with a thin layer of powder or foam, separating the fuel from the surrounding oxygen.

Carbon Dioxide (CO₂) extinguishers

CO₂ extinguishers contain carbon dioxide, a non-flammable gas, and are highly pressurized. The pressure is so great that it is not uncommon for bits of dry ice to shoot out. CO₂ is heavier than oxygen so these extinguishers work by displacing or taking away oxygen from the surrounding area. CO₂

Care and Maintenance of the Fire Extinguisher

Inspect fire extinguishers at least once a month (more often in severe environments).



You must ensure that:

- The extinguisher is not blocked by equipment, coats or other objects that could interfere with access in an emergency.
- The pressure is at the recommended level. On extinguishers equipped with a gauge (such as that shown on the right), the needle should be in the green zone - not too high and not too low.
- The nozzle or other parts are not hindered in any way.
- The pin and tamper seal (if it has one) are intact.
- There are no dents, leaks, rust, chemical deposits and/or other signs of abuse/wear.
- Wipe off any corrosive chemicals, oil, gunk etc. that may have deposited on the extinguisher.

Some manufacturers recommend shaking your dry chemical extinguishers once a month to prevent the powder from settling/packing.

Fire extinguishers should be pressure tested (a process called hydrostatic testing) after a number of years to ensure that the cylinder is safe to use. Consult your owner's manual, extinguisher label or the manufacturer to see when yours may need such testing.

If the extinguisher is damaged or needs recharging, replace it immediately!

IMPORTANT: Recharge all extinguishers immediately after use regardless of how much they were used.

What is the difference between a fire extinguisher inspection and fire extinguisher maintenance?

INSPECTION

An inspection is a “quick check” to give reasonable assurance that a fire extinguisher is available, fully charged and operable. The value of an inspection lies in the frequency, regularity, and thoroughness with which it is conducted. The frequency will vary from hourly to monthly, based on the needs of the situation. Inspections should always be conducted when extinguishers are initially placed in service and thereafter at approximately 30-day intervals.

MAINTENANCE

Fire extinguishers should be maintained at regular intervals (at least once a year), or when specifically indicated by an inspection. Maintenance is a “thorough check” of the extinguisher. It is intended to give maximum assurance that an extinguisher will operate effectively and safely. It includes a thorough examination and any necessary repair, recharging or replacement. It will normally reveal the need for hydrostatic testing of an extinguisher.

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