# How to Choose, Maintain, and Use Fire Extinguishers: The Ultimate Guide

Fire extinguishers are one of those things that we always see in buildings, either on the floor or on the wall inside a glass cabinet, but never give a second thought about.

We know it's good to have in case of emergencies, but do we really know *how* to use it in case there's one?

Ensuring that a fire extinguisher can protect you and the other people in the building in case of fire starts by choosing the right one for your specific needs.

Far from being simple, there is a lot to consider when purchasing the right fire extinguisher:

- Is it the right type for your property?
- How big should the fire extinguisher be?
- How many fire extinguishers do you need?
- How do you maintain fire extinguishers?

And so much more.

In this guide, we're going to take a close look at all these questions, and hopefully, by the end, you will have a better understanding of fire extinguishers and the specific solution you need for your property.

## The Triangle of Safety

To put things into context, let's briefly talk about the "triangle of safety".

Simply put, having the right type of fire extinguishers is not the only thing you need to ensure successful fire suppression.

Three elements need to be present at the time of the start of a fire to completely stop it in its tracks:

1. Equipment
2. Maintenance
3. Training

If one of these is missing or incomplete, the chances of putting out a fire become slim.

Even if you have the right fire extinguisher, it won't be successful in the hands of someone who is not properly trained on how to use it.

If you have trained personnel but the equipment is inappropriate for the kind and size of the fire, or if the equipment is not maintained and is therefore unusable, the fire will not be successfully stopped.

Employers are not only required to install the right types of fire extinguishers in the right locations but they are also expected to provide their employees regular training on when and how to use them.

They should also schedule regular maintenance to make sure the fire extinguishers are ready for use at any time.

## How to Choose a Fire Extinguisher

Not everyone is aware that no single fire extinguisher can fight all kinds of fires. For each kind of fire, there is a specific type of fire extinguisher designed to safely and effectively put it out.

For example, water can stop a fire involving wood, but it can't do the same, and will probably make things worse, for a fire that involves electrical equipment.

Using the wrong kind of fire extinguisher can increase property damage and, worse, endanger the lives of innocent people.

Because of this, the kind of fire extinguisher that you choose must depend on the kind of fire hazard that will most likely occur in the location where the fire extinguisher will be installed.

### Classes of Fire

Let's have a quick science lesson. A fire occurs because of the presence of four elements:

1. Fuel
2. Oxygen
3. Heat
4. Chain reaction

The whole theory behind firefighting is if you remove one or more of these elements, the fire will die.

So, fire extinguishers are basically agents that will remove at least one of the elements of fire.

Fires are classified according to the types of combustible material involved.

Burning papers are very different from a fuel fire, so each requires a different firefighting agent to put them out.

The following are the classifications of fire:

- **Class A** – Ordinary combustibles, e.g., wood, paper, trash, cloth, and plastics; solids that are not metals
- **Class B** – Flammable liquids and gases, e.g., gasoline, paint lacquer, acetone, tar, and oil (but not cooking oils)
- **Class C** – Electrical equipment, e.g., motors, wiring, machinery, or appliances
- **Class D** – Combustible metals/metal alloys, e.g., magnesium, sodium-potassium, potassium, and sodium alloys
- **Class K** – Combustible cooking media, e.g., vegetable or animal oils and fats

> **Point to Consider:** What kind/kinds of fire do you think is most likely to occur in your building or different areas within the building?

### Fire Extinguisher Ratings

Fire extinguishers are rated according to the type of fire they can be used for.

- **Class A** – For Class A fires
- **Class B** – For Class B fires
- **Class A:B** – For Class A and B fires
- **Class A:B:C** – For Class A, B, and C fires (also called Multi-Purpose Fire Extinguishers)
- **Class A:C** – For Class A and C fires
- **Class B:C** – For Class B and C fires
- **Class D** – For Class D fires
- **Class A:K** – For Class A and K fires

**Note 1:** Class C fire extinguishers are simply either Class A or B extinguishers that are non-combustible, making them safe for fires involving electrical equipment.

**Note 2:** Some Class A extinguishers are safe for use on combustible cooking materials. These are the Class A:K extinguishers.

**Note 3:** ABC fire extinguishers are a popular choice because of their versatility. It's ideal if your property is prone to fires involving paper, flammable gas, and electrical equipment.

**UL Rating of Fire Extinguishers**

Fire extinguishers manufactured in the USA undergo a series of tests by OSHA-approved organizations to quantify their ability to put out specific types of fires.

One of these organizations is UL or Underwriters Laboratory.

UL ratings use letters and numbers to signify the type and size of fire that a fire extinguisher will put out.

The letters indicate the fire class it can be used for, and the numbers indicate the firefighting power of the fire agent.

Let's unpack the meaning of a sample UL rating:

## 6A:30B:C

- **6A:** The letter "A" signifies that it is safe for use against Class A fires. The number before "A", in this case it's the number 6, pertains to the number of chemicals/agents in the extinguisher. Multiply this to 1.25, and the product represents its equivalent to gallons of water. In this example, it would take 7.5 gallons of water (6 x 1.25) to match the firefighting power of the agent.
- **30B:** The letter "B" signifies that this extinguisher is safe to use against Class B fires. The number before "B", in this case the number 30, pertains to the number of square footage that the extinguisher can cover or extinguish. A 30B, therefore, means that this extinguisher can put out 30 square feet of a Class B fire.
- **C:** The letter "C" signifies that the agent is non-conductive and is safe to use against Class C fires.

Some fire extinguishers do not come with a numerical UL rating. These include:

- **Class C fire extinguishers.** When "C" is present in the UL rating, it simply means that the agents in the extinguisher are non-conductive and safe to use on an electrical fire. As mentioned before, Class C extinguishers are essentially Class A or B extinguishers with non-conductive properties.
- **Class D fire extinguishers.** They are simply classified as "Class D". On the nameplate of the extinguisher, it should be noted how effective the fire agent is against the specific combustible metal fire for which it is suggested.
- **Class K fire extinguishers.** Because Class K hazards largely vary, Class K fire extinguishers also do not have a numerical rating. A fire extinguisher rated as "6A:K" would contain an equivalent of 7.5 gallons of water (6 x 1.25) and is also approved for use on a Class K fire.

## Types of Fire Extinguishers

Fire extinguishers use different kinds of firefighting agents aside from water.

These agents vary in the way they chemically react with fire.

Remembering the four elements of fire, some agents fight fire by removing the heat while some work by removing oxygen.

Knowing the difference will help you understand what to expect from each type of fire extinguishing agent.

**1. Multi-Purpose ABC Dry Chemical Fire Extinguisher**

- Fights Class A, B, and C fires
- Often used in homes, offices, schools, apartment buildings, vehicles, boats, and RVs
- Sprays a very fine chemical powder commonly composed of mono ammonium phosphate that blankets and suffocates the fire

**2. Carbon Dioxide Fire Extinguisher**

- Fights Class B and Class C fires
- Preferred in offices, factories, and hospitals as they leave no residue and requires no cleanup
- Uses pressurized carbon dioxide gas – a clean, odorless gas – to suffocate the fire by removing oxygen
- Not ideal for confined spaces as it can cause asphyxiation

**3. Wet Chemical Fire Extinguisher**

- Fights Class K fires; can also be used for Class A fires
- Ideal in commercial kitchens and restaurants
- Sprays a liquid mist that cools the fire
- Contains potassium that, upon reacting with the cooking medium, produces a thick soap-like material that covers the surface of the liquid to prevent re-ignition

**4. Halotron Fire Extinguisher**

- Fights Class B, C, and sometimes Class A fires
- Ideal for data centers, computer rooms, control rooms, laboratories, warehouse, offices, vehicles, and other areas with electronic equipment
- Uses a non-conducting agent that evaporates, won't cause thermal or static shock, and will not leave any residue

**5. Foam Fire Extinguisher**

- Fights Class A and B fires
- Can be used in schools, offices, residential buildings, and warehouses

- Sprays a foaming agent that cools down the fuel and creates a barrier between the fuel and flame
- Leaves large amounts of residue

**6. Water Spray Fire Extinguisher**

- Fights Class A fires
- Ideal anywhere organic materials such as paper, plastics, and wood are present; also used in hospitals and first response vehicles

**Summary:** The rating and type of fire extinguisher agent needed depend on the property's contents, purpose, and design.

## Installation of Fire Extinguishers

### Placement and Spacing

Determining the type, number, and location for the installation of fire extinguishers requires careful assessment of the **fire risk** and **hazard level**.

This is ideally done through a fire risk assessment, a survey of a building conducted by professionals to assess its fire risk and offer recommendations to make the building safer and more prepared in case of a fire emergency.

As specified by the NFPA 10 2018 edition, fire extinguishers must be placed in readily accessible locations without any obstructions.

Each unit must also be placed within the required travel distance or the distance one will have to travel from the fire site to access a fire extinguisher.

The following are the fire extinguisher spacing and placement recommendations in NFPA 10 2018 edition:

1. **Class A Fire Extinguishers – Travel distance within 75 feet**

In areas with mainly Class A combustible materials such as hallways, offices, and classrooms, the NFPA recommends having one 2A fire extinguisher for every 3,000 square feet.

OSHA requires a travel distance of 75 feet or less from the site of the fire to a fire extinguisher.

2. **Class B Fire Extinguishers – Travel distance within 50 feet**

Locations with Class B flammables, such as storage areas, warehouses, workshops, research operations, garages, and manufacturing areas are required to have a Class B extinguisher within 30- or 50-feet travel distance.

The actual travel distance varies depending on the hazard level and size of the extinguisher. Please see more details here.

3. **Class C Fire Extinguishers – Travel distance based on Class A or B requirements**

Since Class C extinguishers are simply non-combustible Class A or B extinguishers (or a combination of both), the placement for Class C extinguishers is based on the expected Class A or B hazards in the area.

4. **Class D Fire Extinguishers – Travel distance within 75 feet**

For locations where combustible metal powders, shavings, or flakes are produced at least once every two weeks, Class D extinguishers must be installed not more than 75 feet from the fire site.

5. **Class K Fire Extinguishers – Travel distance within 75 feet**

Class K extinguishers must be placed at a maximum travel distance of 30 feet in areas with potential fire hazards from combustible cooking media (vegetable or animal oils and fats) such as commercial kitchens, restaurants, and cafeterias.

## Installing Portable Fire Extinguishers

Fire extinguishers can be mounted on walls either with a **fire extinguisher cabinet** or **metal wall-mounting brackets**.

Cabinets are usually made of wood, glass, or metal and are designed to be tamper-proof and rust- and corrosion-resistant.

The cabinet you choose must be strong enough to handle the size of your fire extinguisher but still be easy to break open in case of a fire.

Cabinets can be mounted on the wall, in vehicles, and in many other areas.

Metal wall-mounting brackets are also another great option for securely mounting fire extinguishers to walls.

If using brackets, they must be suitable for the extinguisher and be fixed to the wall according to the manufacturer's instructions.

It must also allow the fire extinguisher to be easily removed in the case of a fire.

**How high above the floor must the extinguisher be mounted?**

In OSHA's e-Tool for Evacuation Plans and Procedures, the agency states the following guidelines:

- Fire extinguishers weighing no more than 40 lbs. should be mounted with their carrying handles no higher than 5 feet from the floor.
- Larger fire extinguishers weighing over 40 lbs. must be mounted at lower heights with their carrying handles no more than 3.5 feet from the floor.
- All fire extinguishers must have at least 4 inches of clearance between their bottoms and the floor.

**What other considerations must be made when installing fire extinguishers?**

Before installing fire extinguishers, it's best to check your local fire code which may specify a tighter range than the ones required by OSHA.

You should also check local building codes which often incorporate guidelines from newer versions of the NFPA standard for portable extinguishers or from the Americans with Disabilities Act.

## How to Maintain a Fire Extinguisher

There's nothing worse than having a fire break out and finding your fire extinguisher damaged and unusable.

This is why fire extinguishers need to regularly undergo three kinds of tests:

1. **Visual Inspections – Once per Month**

The OSHA [29 CFR 1910.157(e)(2) states that employers must visually inspect portable fire extinguishers at least once every month.

This is a good benchmark for homeowners or residential building owners to follow.

The visual inspection should tell you if the fire extinguisher is still in its designated place, if it is free from damage, if any obstruction makes it difficult to access, and if it is fully charged and operational.

What should you look for when inspecting a fire extinguisher?

- Look for signs of physical damage such as dents, leakage, or corrosion.
- Check if the pressure gauge indicator is in the operating range.
- Ensure that the pull-pin is still in place and the pull-pin seal is intact.

- Verify the date of the last professional inspection.
- Log the monthly inspection by writing the date and the inspector's initials on the back of the tag.

2. **Maintenance Inspections – Once per Year**

Yearly full maintenance checks of fire extinguishers are also required as stated in OSHA 29 CFR 1910.157(e)(3).

This means a thorough examination of all fire extinguishers in the facility.

Annual fire extinguisher maintenance inspections must be performed by licensed professionals who are properly trained to spot not-so-obvious problems and potential hazards.

Once a fire extinguisher passes the test, the inspector verifies it with a dated inspection tag which is good for one year.

If the unit fails, it must be repaired or replaced.

3. **Internal Maintenance Inspection – Every 5, 6, or 12 Years (depending on equipment type)**

Fire extinguishers also need a hydrostatic test which is done to test the shell for integrity and ability to maintain the pressure necessary to discharge properly.

As required by OSHA, carbon dioxide, pressurized water, and wet chemical extinguishers are to be tested every 5 years.

Dry chemical extinguishers need to be tested every 12 years as well as an internal examination every 6 years.

Please refer to OSHA 29 CFR 1910.157(f)(3) for the complete information on test intervals for various types of extinguishers.

> **Point to Consider:** Although monthly inspections are not required to be documented, many employers prefer having a system that lets them document monthly and yearly maintenance. What is the most efficient way for you to document inspections and maintenance of fire extinguishers?

## How to Use a Fire Extinguisher

Fire extinguishers must only be used by someone with proper training.

And even then, it must only be used to put out a fire in its very early stages.

Fire extinguishers are not recommended to use against large or spreading fires.

Generally, you should only use a fire extinguisher if the answer to all of the following questions is “yes”:

- Is the fire small and contained in a small area (like a trash bin or pan)?
- Is there a safe escape route?
- Are you safe from the fire’s toxic smoke?
- Are you trained and physically able to use a fire extinguisher?
- Is the available fire extinguisher the right type for the fire’s fuel?

If there is the slightest doubt or if you don’t feel safe using the fire extinguisher, do not try to tackle the fire on your own. Call 911 and have everyone leave the building immediately. Close the doors to contain the fire.

Using the fire extinguisher involves 4 simple steps as outlined by the acronym PASS:

**P** – Pull the safety pin from the handle while holding the fire extinguisher upright.

**A** – Aim the extinguisher nozzle or hose at the base of the fire. Start back 8-10 feet.

**S** – Squeeze the handle to discharge the agent.

**S** – Sweep from side to side until the fire is out.

Keep in mind that in every fire situation, the highest priority is to ensure the safety of human lives.

If you feel that your and others’ safety is in danger, it’s best to vacate the building and call the fire department.

If the fire is very small but there is no fire extinguisher, or you’d rather not use one, you can try covering the fire with a wet cloth or towel or shoveling sand or dirt over it.

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With careful planning, research, and collaboration with the right people, you will be able to outfit your property with the right fire extinguishers.

If you’re ready to shop around for fire extinguishers, browse through our collection of Amerex fire extinguishers, some of the world’s best and most reliable fire extinguishers.

Feel free to call us at 888-844-3765 if you have more questions.