

FIRE EXTINGUISHERS

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Portable fire extinguishers allow you to quickly control small fires before they can rage out of control. However, using the wrong fire extinguisher can be worse than not using anything at all, or even fatal.

What type fire extinguisher do you need? It depends on the type fires you encounter. Let's start by looking at how fires function and then the classifications of fires.

How fires burn

Fires are chemical reactions that combine fuel and oxygen to produce heat and light. However, there is plenty of fuel and oxygen around us at all times, and it is not burning, so something else is required to start the chemical reaction. That something is heat. Any fuel must be heated to its ignition temperature before it can burn. Fortunately, materials such as wood, cotton, gasoline must be heated to fairly high temperatures before they burn.

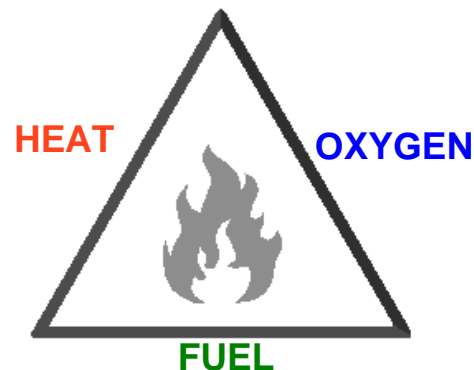
It is easier for us to picture the relationship between fuel, heat and oxygen as the three sides of a triangle. We call this the "fire triangle."

All three sides of the triangle are necessary for a fire to burn. Therefore, to extinguish a fire, we can remove one of the sides.

The most plentiful extinguishing agent we have is water. When applied to a fire, water absorbs very large amounts of heat and cools the fuel below the ignition temperature. A layer of water or steam also prevents contact between the fuel and air (oxygen).

Another common extinguishing agent is carbon dioxide (CO₂), which blankets the fuel with a layer of the dense gas to exclude oxygen. The CO₂ also cools the fuel below its ignition temperature.

Other common extinguishing agents include dry chemicals which blanket the fire and interrupt the burning process and are among the most effective materials for portable fire extinguishers. Halon extinguishers use CFC (freon type) gases that blanket the fire and interrupt the burning process.



THE FIRE TRIANGLE

(Expect Halon extinguishers to disappear from the market, and possibly be recalled, due to the ban on manufacture of CFCs.)

Classes of fires

There are four classes of fires, each designated by a letter and symbol. You will find the letters and symbols for each class of fire an extinguisher is intended for marked on the label. The four classes of fires are:



Class A fires involve "ordinary combustibles," such as wood, paper, grass, leaves, insulation, etc. The best way to control Class A fires is by cooling the fuel below the ignition temperature. Water is perhaps the best material we have available for this purpose. Water absorbs a tremendous amount of heat, is cheap and environmentally safe.



Class B fires are fueled by burning liquids such as gasoline, grease, diesel fuel, lubricating oil, cooking oil, etc. These fires can be very hot and are easily spread. Using water is the worst thing you can do with most Class B fires. Water instantly boils when it hits the hot fuel, splattering the burning fuel and spreading the fire. Water also allows the burning fuel to float away, spreading the fire. Dry chemical and carbon dioxide (CO₂) extinguishers are best for Class B fires.



Class C fires are basically the same as Class A and Class B fires, *but with one major difference - ELECTRICITY*. Once the electricity is disconnected, the fire can be treated as Class A or Class B. However, since disconnecting power may not be easily accomplished during an emergency, use only fire extinguishers rated for Class C fires. These extinguishers use materials that cannot conduct electricity. Dry chemical and carbon dioxide (CO₂) extinguishers are suitable for Class C fires.



Class D fires involve burning metals, such as sodium, magnesium, titanium, etc. These fires are not very common around the farm or home. Places they could occur might include

aluminum-magnesium alloy wheels and engine castings. Special fire extinguishing agents are necessary for Class D fires. In an emergency, use sand or soil. Do not use water as it can react violently with burning metals.

Selecting an extinguisher

Select an extinguisher that is rated for the classes and sizes of fires you might expect. Here are some considerations when selecting extinguishers.

If Class A fires are all that you would expect and the extinguishers will not be subjected to temperatures below freezing, then consider water extinguishers. Hay barns and woodworking shops might be good candidates for water type extinguishers. However, these extinguishers cannot be used on electrical fires, liquid fuels or in freezing weather. Special antifreeze must be used to protect them from freezing (*DO NOT* use automobile antifreeze because ethylene glycol will burn).

The best all-round choice for farmers and homeowners are multipurpose Class A-B-C dry chemical extinguishers. These have several advantages. They can be used on virtually any fire you might expect, they are widely available and among the least expensive extinguishers. Also, they do not freeze in winter and can withstand outdoor exposures encountered on farm machinery.

Carbon dioxide (CO₂) extinguishers are not a good choice for most areas. Carbon dioxide extinguishers are ineffective on Class A fires, and their strong blast of gas tends to spread fires by blowing away burning paper and other lightweight materials.

Also, CO₂ extinguishers require more experience and a more aggressive approach than dry chemical extinguishers. In training workshops, we have found that people cannot extinguish small, but hot diesel fuel fires nearly as readily with CO₂ as with Class A-B-C dry chemical extinguishers. Some people exhaust a 5-pound CO₂ extinguisher without controlling the fire, but as many as four or five people extinguish the same size fire using one 5-pound Class A-B-C dry chemical extinguisher.

Extinguishers that will be exposed to weather or wet conditions should be approved for the exposure. It is probably suitable if the extinguisher is Coast Guard approved.

Extinguisher ratings

Fire extinguishers ratings include numbers and letters. The number indicates the size fire that can be extinguished, and the letters indicate the class.

Here is what the ratings mean:

- 2-A rating can extinguish 100 square feet of wood test fire
- 2-B can extinguish about 2 square feet. of flammable liquid
- no number is assigned to the C rating - it only means it is safe for use on electrical fires.

When you buy an extinguisher, remember that the ratings are based on test fires under controlled conditions. You may not be able to control fires as large as indicated by the ratings, but under ideal conditions and with expert use you might control larger ones.

Where to install fire extinguishers

Place fire extinguishers where they can be reached easily during an emergency. Place them in plain sight near exits, rather than right at the fire hazard.

Extinguishers should be mounted on brackets that hold them off the floor, but not over about four feet high (so youth and short adults can easily remove them).

Consider placing extinguishers in the following locations:

- kitchen (1A 10BC)
- near wood heaters (1A 10BC)
- garage (1A 10BC)
- shop (1A 10BC)
- each automobile (1A 10BC)
- each tractor or other self-propelled farm machine, especially combines (2A 20BC)
- livestock barns (2A 20BC)
- pesticide storage areas (2A 20BC)
- fuel storage areas (2A 20BC)

Maintain your extinguishers

Inspect each fire extinguisher regularly (at least quarterly). A faulty extinguisher is useless.

- make sure the extinguishers are where they are supposed to be and easily accessible
- check the pressure gauge to be sure the needle is in the proper range (it is OK for it to be a little on the high side during hot weather and a little low during the winter)
- remove dry chemical extinguishers from their brackets, turn them upside down and shake them to loosen the powder
- replace or recharge any discharged or defective extinguishers immediately
- hydrostatic testing to detect damaged or weakened cylinders must be done every 10 years for carbon dioxide (CO₂) and every 5 years for dry chemical and water type extinguishers

Many homeowners and farmers prefer to purchase less expensive extinguishers, and that is fine as long as they realize that these extinguishers are usually not rechargeable. These extinguishers are just as effective as the more costly ones, but must be replaced after use. Manufacturers also recommend replacement after a certain number of years (these cannot be hydrostatically tested).

Using an extinguisher

To use a fire extinguisher:

- evacuate the area and call the fire department first
- remove the extinguisher from its bracket and carry it to the scene
- break the seal and pull the pin from the handle (don't squeeze the handle while trying to do this because it clamps down on the pin; set the extinguisher down if necessary; twist the pin hard to break the seal)
- approach to about 6 - 10 feet from the fire
- aim at one side of the base of the fire
- squeeze the handle and sweep extinguishing agent across the fire from side to side, approaching closer for better coverage when the flames are knocked down
- when the fire is 'out', watch for hot spots that might re-ignite

- *ALWAYS KEEP A CLEAR ESCAPE ROUTE BEHIND YOU - never get yourself in danger*

Practice using an extinguisher

The only way to learn to use a fire extinguisher is to actually use one. Take advantage of the opportunity to use one through training programs at work, or practice in a safe place at home.

Class A fires can be used because they are inexpensive and the practice extinguisher is cheap (your garden hose). Build a small fire from wood scraps on bare ground. After the fire catches, practice the motion of extinguishing the fire.

Practice Class B fires using a metal basin (part of a 30 or 55 gallon drum or an old wash tub works

well) and a small amount of combustible liquid such as kerosene or diesel fuel. Ignite the fuel with a torch made of an oil-soaked rag wrapped on the end of a long metal rod and use kerosene, diesel fuel or mineral spirits for the fuel (*DO NOT* use gasoline or other highly flammable fuels). Use a dry chemical extinguisher that is scheduled for testing or replacement, or use an inexpensive one bought for the purpose. To clean up after practice, let the fire burn out.

When you need it - use it

Yes, fire extinguishers can make quite a mess, but the fire will make a much bigger mess if you don't control it.

Don't waste time. Take action!

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