

# TerranearPMC Safety Share

## Week of September 22, 2014 – Fire Extinguisher ABC's

Whether you work in an office building or at a remote work site, fire extinguishers are an effective way to extinguish an unwanted fire while still in its incipient stage. It is also a legal requirement to have the right number of fire extinguishers available as well as the right kind.

Many of us look at fire extinguishers as a fairly modern invention....Actually it was the Greek mathematician, Ctesibius of Alexandria, who at about 200 BC invented a hand pump able to deliver water to extinguish a fire. In the middle Ages, a device known as a 'squirt' began to be used to apply jets of water to fires. The squirt worked rather like a bicycle pump. The nozzle was dipped into water and about one liter was sucked up by pulling out the plunger. These devices were actually used in the Great London Fire of 1666, and due to the devastation of this event, it was apparent that something else needed to be used to fight fires!

It was in 1819 that Captain George William Manby came up with the first version of the modern portable fire extinguisher. It consisted of a copper vessel of 3 gallons of pearl ash (potassium carbonate) solution under compressed air pressure. Then around 1912 it was discovered that chlorinated solvents were excellent materials to extinguish fires. This resulted in the invention of the carbon tetrachloride or CTC extinguisher. This device had a capacity of 1 imperial quart (1.1 liters) and vaporized CTC to extinguish flames by interfering with the chemical reaction. While suitable for liquid and electrical fires and popular in motor vehicles for the next 60 years, CTC was highly toxic and took devastating toll on many of its users, causing severe illness and even deaths when they were used in such locations such as enclosed locations and confined spaces where there was limited ventilation.

Today, there are five basic classes of fire extinguishers:

A fire extinguisher having an "A," indicates that it is to be used for ordinary combustible materials such as paper, wood, cardboard, and most plastics. They are identified with a green triangle on the label.

Class B fire extinguishers are designed to extinguish fires caused by flammable or combustible liquids such as gasoline, kerosene, grease and oil and are designated with a red square.

Class C fires involve electrical equipment, such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish class C fires! The C classification means the extinguishing agent is non-conductive and has a blue circle as its identifying feature.

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. Their symbol is a 10-sided, yellow star.



Class K fire extinguishers – the latest fire extinguisher designation - are for fires that involve cooking oils, trans-fats, or fats in cooking appliances and are typically found in restaurant and cafeteria kitchens. Their geometric symbol is a black hexagon.

Not only do fire extinguishers have letter classifications, but numbers are located in front of the A or B ratings. For Type A extinguishers, the number 1 indicates that the extinguisher has the fire-fighting ability of 1.25 gallons (4.7 liters) of water; a number 2 extinguisher has the fire-fighting ability of twice as much water, number 3 has the fire-fighting ability of three times as much water. For Type B or Type B:C extinguishers, the number indicates the number of square feet of burning material that the typical user should be able to put out with the extinguisher. So a typical modern dry-chemical extinguisher might be rated 3-A:40-B:C. This means that on burning paper or wood, it will be as effective as 3.75 gallons (14 liters) of water. It can be used to extinguish burning liquids and gases even where there is electrical equipment present, as long as the burning area doesn't exceed 40 square feet. The bigger the number, the bigger the fire you can put out. However, it is important to remember that fire extinguishers are designed to fight fires during their initial stages. If an entire room (or more) is burning, it's time to forget about the fire extinguishers and escape; you need professional firefighters!

Portable fire extinguishers are required to be **visually inspected** when initially placed in service and at least monthly thereafter. Visual inspections can be performed by project/facility staff and should include the following:

- Extinguishers are in their designated places
- There are no obstructions to access or visibility
- Safety seals are not broken or missing
- There is no evidence of physical damage, corrosion, leakage or clogged nozzle
- Pressure gauge readings are in the proper range or position
- Operating instructions are legible and facing outward
- Fullness – confirmed by weighing or lifting

Maintenance of a fire extinguisher is required at least once a year. Maintenance involves a thorough examination of the mechanical parts, extinguishing agent and expelling means of each portable fire extinguisher. Annual maintenance must be performed by an approved extinguisher servicing company.

Every 6 years, dry chemical extinguishers must be emptied and refilled. At certain intervals, fire extinguishers are required to be pressure tested using water or some other non-compressible fluid to help prevent unwanted failure or rupture of the cylinder. This is called hydrostatic testing and includes both an internal and external examination of the cylinder. Because this testing requires special training and equipment, it needs to be performed by an approved extinguisher servicing company. Hydrostatic testing for some of the most commonly found extinguishers are as follows:

- Pressurized water, carbon dioxide and wet chemical extinguishers – every 5 years
- Dry chemical extinguishers – every 12 years



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Almost as important as conducting inspections and testing and maintenance, is documentation. Monthly inspections require documentation for the date the inspection and the initials of the person performing the inspection. This must be recorded on a tag or label attached to each extinguisher. As an alternate, the monthly inspections can be recorded on an inspection checklist maintained on file or in an electronic system that provides a permanent record.

Annual maintenance is also required to be recorded on a tag or label attached to each extinguisher that indicates the month and year the maintenance was performed and the name of the person or company performing the service.

Six-year maintenance is required to be recorded on a metallic label, or similar durable material, affixed to each extinguisher that indicates the month and year the maintenance was performed, the initials or name of the person performing the service and the name of the company they represent. Old maintenance labels must be removed at the time any new labels are affixed to the extinguisher.

When extinguishers are recharged, a tag or label must be attached to each extinguisher that indicates the month and year recharging was performed and the name of the person or company performing the service (Note: many times there is a place to document monthly inspections on this same tag).

There are many steps necessary to ensure your fire extinguishers will operate correctly. Monthly inspections, annually maintenance as well as 6-year maintenance and hydrostatic testing are all essential. Without these steps, your fire extinguisher may not be able to stop a fire.

**Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time.**

Thomas A. Edison

