

LOSS PREVENTION BULLETIN

PORTABLE FIRE EXTINGUISHERS



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Extinguishers are effective only when fires are in the first stages. It is of great importance that they be immediately accessible and promptly used. They are the first line of fire defence and never a substitute for automatic sprinklers, which are the main line of defence.

Extinguishers are only as good as the operators using them. It pays to train key employees on each shift, frequently and thoroughly. The most effective training method is to have as many employees as possible use extinguishers to put out fires in the yard, similar to those that might break out in their own departments. It is also important to train employees in the use of small hose.

Many industrial fires are promptly discovered and quickly extinguished by alert employees using Portable extinguishers before any serious damage is done. Good fire protection calls for ample hand fire-fighting equipment distributed throughout the plant and maintained carefully, with employees trained to use it properly. Extinguishers must be in good operating condition whenever fire strikes. Mechanical failure can have serious consequences. Maintenance and recharging must be carried on systematically by competent personnel.



With proper inspection, testing and maintenance (ITM) protocols fire extinguishers can be long lasting, reliable options for combating a small fire early on. This Loss Prevention Bulletin will address the NFPA 10, Standard on the Installation or Portable Fire Extinguishers requirements that help ensure your extinguisher is ready.

LOCATION AND DISTRIBUTION OF EXTINGUISHERS

Locate extinguishers conspicuously where they are not likely to be blocked or hidden by stock or damaged. It is generally best to hang them on building columns or walls with their tops 3 to 5 ft (1 to 1.5 m) above the floor. Painted markings and signs can be used to direct attention to the location of extinguishers and to their proper use.

Extinguishers for fires other than in ordinary combustibles should be located close to the hazard to be protected (at least within 50 ft [15 m]) where they will be accessible during a fire.

TYPES OF PORTABLE FIRE EXTINGUISHER

Different types of fire extinguishers are designed to fight different types of fire. The three most common types of fire extinguishers are air-pressurized water, carbon dioxide (CO₂), and dry chemical.

- ✓ Water is one of the most commonly used extinguishing agents for ordinary combustibles. Air-pressurized water extinguishers are filled approximately two-thirds with water, then pressurized with air. In some cases, detergents are added to produce a foam. Air-pressurized water extinguishers extinguish fire by cooling the surface of the fuel to remove the “heat” element of the fire triangle. Never use water to extinguish flammable liquid or electrical fires.
- ✓ CO₂ extinguishers are filled with CO₂, a non-flammable gas under pressure. These extinguishers put out fires by displacing the oxygen, and, because of the high pressure, they also have a cooling effect on fires. CO₂ extinguishers are designed for flammable liquid and electrical fires only.

- ✓ Dry chemical extinguishers put out fires by coating the fuel with a thin layer of fire-retardant powder, separating the fuel from the oxygen.
- ✓ UL and NFPA 10 classify fire extinguishers by the type of fire that they will extinguish.



Class A fire extinguishers are used for ordinary combustibles such as wood, paper, some plastics and textiles. This fire class requires the heat-absorbing effects of water or the coating effects of certain dry chemicals. According to NFPA, extinguishers suitable for Class A fires should be identified by a triangle containing the letter “A.” If in colour, the triangle should be green.

Class B fire extinguishers are used for flammable liquid and gas fires such as oil, gasoline, etc. These fire extinguishers deprive the fire of oxygen and interrupt the fire chain by inhibiting the release of combustible vapours. According to NFPA, extinguishers suitable for Class B fires should be identified by a square containing the letter “B.” If in colour, the square should be red.

Class C fire extinguishers are used on fires that involve live electrical equipment that require the use of electrically nonconductive extinguishing agents. Once the electrical equipment is de-energized, extinguishers for Class A or B fires may be used. According to NFPA, extinguishers suitable for Class C fires should be identified by a circle containing the letter “C.” If in colour, the circle should be blue.

Class D fire extinguishers are used on combustible metals such as magnesium, titanium, sodium, etc., which require an extinguishing medium that does not react with the burning metal. According to NFPA, extinguishers suitable for Class D fires should be identified by a five-point painted star containing the letter “D.” If in colour, the star should be yellow.

Class K fire extinguishers are used on fires involving cooking media (fats, grease and oils) in commercial kitchens. Due to the higher heating rates of vegetable oils in commercial cooking appliances, the NFPA Standard for Portable Fire Extinguishers (NFPA 10) includes a Class K extinguisher. These fire extinguishers work on the principle of saponification, which takes place when alkaline mixtures such as potassium acetate, potassium citrate or potassium carbonate are applied to burning cooking oil or fat. The alkaline mixture

combined with the fatty acid creates a soapy foam on the surface that holds in the vapours and steam and extinguishes the fire. These extinguishers are identified by the letter “K.”

Fire Extinguisher Ratings

Located on the fire extinguisher label is the UL rating, which is broken down into Class A and Class B:C numerical ratings. These numerical ratings allow users to compare the relative extinguishing effectiveness of various fire extinguishers. For example, an extinguisher that is rated 4A:20B:C indicates the following:

The A rating is a water equivalency rating. Each A is equivalent to 1.25 gallons of water; 4A = 5 gallons of water. The B:C rating is equivalent to the amount of square footage the extinguisher can cover, related to the degree of training and experience of the operator; 20 B:C = 20 square feet of coverage.

C indicates it is suitable for use on electrically energized equipment.

Note that there is not a numerical rating for Class C or Class D fires. Class C fires are essentially either a Class A or Class B fire involving energized electrical equipment where the fire extinguishing media must be nonconductive. The fire extinguisher for a Class C fire should be based on the amount of the Class A or Class B component. For extinguisher use on a Class D fire, the relative effectiveness is detailed on the extinguisher nameplate for the specific combustible metal fire for which it is suggested.

The following chart contains the OSHA-specified maximum travel distances to an extinguisher by fire class.

Fire Class	Travel Distance
Class A	75 feet
Class B	50 feet
Class C	Based on appropriate A or B Hazard
Class D	75 feet

According to NFPA 10, the travel distance to a Class K fire extinguisher must not exceed 30 feet.

The requirements are broken down into three different sections on inspection, maintenance and testing. In each section there is information on what needs to be done (Procedures), who is allowed to perform the work, how often each step needs to be done (Frequency) and how to document the work (Recordkeeping).

INSPECTION

Procedures

Performing an inspection is the easiest thing you can do to ensure your extinguisher can be used reliably and effectively in an emergency. At a minimum, inspection needs to consist of the following steps:

- ✓ Make sure it is located in its designated place
- ✓ Make sure the extinguisher is visible or that there is signage indicating where the extinguisher is located.
- ✓ Make sure you can easily access the extinguisher
- ✓ Ensure the pressure gauge is in the operable range or position



- ✓ Make sure it is full, this can be done by just lifting the extinguisher or you can weigh it
- ✓ For wheeled extinguishers, make sure the condition of tires, wheels, carriage, hose, and nozzle are acceptable
- ✓ For non-rechargeable extinguishers, operate the push-to-test pressure indicators

Frequency

NFPA 10 requires extinguishers be inspected when they are initially installed and once a month after that. You should inspect extinguishers more frequently if they are installed in locations where they are more prone to rust, impact or tampering.

Recordkeeping

Records of the monthly inspections need to be maintained by either putting a tag or label on the extinguisher or by having it recorded on paper or electronic files. The following items need to be recorded:

- ❖ The month and year of the inspection
 - ❖ The person conducting the inspection
- These records need to be maintained for at least 12 months.



MAINTENANCE

Procedures

Maintenance procedures must include the procedures detailed in the manufacturer's service manual and a thorough examination of the basic elements of the fire extinguisher, including the following:

- ✓ Mechanical parts of all fire extinguishers
- ✓ Extinguishing agent
- ✓ Expelling means

- ✓ Physical condition

This is completed by doing an external examination. An internal examination can also be required as part of your maintenance. Details on how to do an internal examination are located in your fire extinguisher service manual.

Frequency

Fire extinguishers need to have an external maintenance examination conducted on a yearly basis, at the time of hydrostatic test, or when specifically indicated by an inspection discrepancy. Extinguishers need to have an internal examination conducted at anywhere from 1-6 year intervals depending on the type of extinguisher.

Recordkeeping

Each fire extinguisher shall have a tag or label securely attached that indicates that maintenance was performed. The tag or label needs to identify the following:

- ✓ Month and year maintenance was performed
- ✓ Person performing the work
- ✓ Name of the agency performing the work

Extinguishers also need a verification-of-service collar located around the neck of the container if an internal examination was conducted. That collar needs to have:

- ✓ Month and year the work was performed
- ✓ Name of the agency performing the work

Fire Extinguishers Maintenance

Ensure Accessibility: Make sure the extinguisher is in its proper spot, visible and easy to access.

Inspect The Seals: Look over the tamper and safety seals to make sure they are intact.

Check The Pressure: If your fire extinguisher has a pressure gauge, be sure that the gauge needle indicates proper pressure.

Look For Damage: Visible signs of damage, such as corrosion, leakage or a clogged nozzle, may mean it's time to replace the extinguisher.

Document Your Inspection: Keep track of your extinguisher monthly checks and maintenance.

HYDROSTATIC TESTING

Procedures

A hydrostatic test always begins with an internal and external examination of the extinguisher as described in the maintenance section. The extinguisher then has many of its components removed so it is stripped down to pretty much just the shell and hose and is filled with water at a certain pressure for a certain time. The extinguisher must then be completely dried to get rid of all of the water and is then reassembled and recharged. If there is any leakage, distortion or permanent moving of couplings the cylinder fails the hydrostatic test and it must be condemned.



Frequency

Like internal maintenance, hydrostatic testing is done at different intervals based on the type of extinguisher you have. These are done either every 5 or 12 years. See Table 8.3.1 in NFPA 10 to see which applies to your type of extinguisher.

Recordkeeping

For low pressure cylinders a label is required to be attached to the extinguisher. It needs to contain:

- ✓ The name of the person conducting the test
- ✓ The date of the test
- ✓ The pressure at which the test was performed

For high pressure cylinders the testers identification number and the date must be stamped onto the shoulder, top, head, neck or foot ring.

REFERENCES:

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Incorporation: January 31, 2005

Main objective: Act as composite insurance broker (Life, Non-life & Reinsurance)

Our presence: Ahmedabad, Ankleshwar, Surat, Rajkot, Delhi, Mumbai, Gift City (Gandhinagar) and expanding in northern and southern regions.

Beacon insurance has a team of qualified MBA'S, Engineer's & Professionals certified from the Insurance Institute of India. The organization is set up to develop core competency in insurance sector. We started our operations in the year 2005. Since then, beacon is effectively managing insurance portfolio of numbers of individuals, small, medium and large corporate.

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Beacon is committed to bring changes in the mindset of Indian corporates about effectiveness of implementing insurance as risk management tool.