

Introduction

Almost all fires are small in their early stage and can be put out quickly if the proper fire extinguisher is available, and the person discovering the fire has been trained to use the fire extinguisher at hand.

To be effective, portable fire extinguishers must be:

1. Approved by a recognized testing laboratory (Extinguishers manufactured in the U.S. are generally approved by Factory Mutual (FM) and listed by Underwriters' Laboratories, Inc. (UL));
2. Of the proper type for the class of fire expected;
3. Located where they are readily accessible for immediate use and in sufficient quantity and size to deal with the expected fire;
4. Inspected and maintained on a regular basis so that they are kept in good operating condition; and
5. Operated by trained personnel who can use them effectively.

Classification

Fire extinguishers are classified by the type of fire that they will extinguish.

A
COMBUSTIBLES

A **Class A** fire extinguisher is used for ordinary combustibles, such as wood, paper, some plastics and textiles. This class of fire requires the heat-absorbing effects of water or the coating effects of certain dry chemicals. Extinguishers that are suitable for Class A fires should be identified by a triangle containing the letter "A." If in color, the triangle should be green.

B
LIQUIDS

A **Class B** fire extinguisher is 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 vapors. Extinguishers that are suitable for Class B fires should be identified by a square containing the letter "B." If in color, the square should be red.

C
ELECTRICAL EQUIPMENT

A **Class C** fire extinguisher is used on fires that involve live electrical equipment which require the use of electrically nonconductive extinguishing agents. (Once the electrical equipment is deenergized, extinguishers for Class A or B fires may be used.) Extinguishers that are suitable for Class C fires should be identified by a circle containing the letter "C." If in color, the circle should be blue.

COMBUSTIBLE METALS



A **Class D** fire extinguisher is used on combustible metals such as magnesium, titanium, sodium, etc., which require an extinguishing medium that does not react with the burning metal.

Extinguishers that are suitable for Class D fires should be identified by a five-point painted star containing the letter "D." If in color, the star should be yellow.

Labeling

Fire extinguishers are labeled so users can quickly identify the classes of fire on which the extinguisher will be effective. The marking system combines pictographs of both recommended and unacceptable extinguisher types on a single identification label. Following are examples of typical labels.

Extinguisher for Class A, B and C



Extinguisher for Class B and C



Extinguisher for Class A and B



Extinguisher for Class A



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

1. The A rating is a water equivalency rating. Each A is equivalent to 1¹/₄ gal. of water. 4A=5 gal. of water.
2. The B:C rating is equivalent to the amount of square footage that the extinguisher can cover, handled by a professional. 20 B:C=20 sq. ft. of coverage.
3. C indicates it is suitable for use on electrically energized equipment.

When analyzing these ratings, 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 non-conductive. 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 recommended.

OSHA requires that employers select and distribute fire extinguishers based on the classes of anticipated workplace fires and also on the size and degree of the hazard which would effect their use. The following chart contains OSHA requirements for classes of fires and travel distance to an extinguisher. Some local requirements may be more strict, so you should always check with your local fire marshal and insurance agent.

Fire Class	Travel Distance
Class A*	75' (22.9m) or less
Class B	50' (15.2m)
Class C	Based on appropriate A or B Hazard
Class D	75'

* The employer may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system installed for emergency use by employees instead of Class A portable fire extinguishers. Such systems must meet the respective requirements of 29 CFR 1910.158 or 1910.159—that they provide total coverage of the area to be protected, and that employees are trained at least annually in their use.

Inspections

Portable fire extinguishers must be visually inspected monthly. The inspection should assure that:

1. Fire extinguishers are in their assigned place;
2. Fire extinguishers are not blocked or hidden;
3. Fire extinguishers are mounted in accordance with NFPA Standard No. 10 (Portable Fire Extinguisher);

4. Pressure gauges show adequate pressure (CO₂ extinguisher must be weighted to determine if leakage has occurred);
5. Pin and seals are in place;
6. Fire extinguishers show no visual sign of damage or abuse;
7. Nozzles are free of blockage.

Maintenance of an extinguisher means a complete examination, and involves disassembly and inspection of each part and replacement where necessary. Maintenance should be done at least annually or more often if conditions warrant.

Hydrostatic testing of portable fire extinguishers is done to protect against unexpected in-service failure. This can be caused by internal corrosion, external corrosion, damage from abuse, etc. Hydrostatic testing must be performed by trained personnel with proper test equipment and facilities. OSHA requires hydrostatic testing according to the following schedule:

Table 1 From 29 CFR 1910.157

Type of Extinguishers	Test Interval (Years)
Soda acid (soldered brass shells) (until 1/1/82)	(*)
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (soldered brass shells) (until 1/1/82)	(*)
Foam (stainless steel shell)	5
Aqueous Film Forming Foam (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated with mild steel shells	12

* Extinguishers having shells constructed of copper or brass joined by soft solder or rivets shall not be hydrostatically tested and shall be removed from service by January 1, 1982. (Not permitted.)

For additional information on portable fire extinguishers and their proper placement and use, contact your local fire department.

Common Questions

- Q.** Are signs required to identify fire extinguisher locations?
- A.** Locations must be identified, but signs are not required. 29 CFR 1910.157(c)(1)
- Q.** Can halon still be purchased in a portable fire extinguisher?
- A.** Recycled halon can still be used in portable fire extinguishers, although it is very expensive and alternatives such as CO₂ should be used when possible.

Sources for More Information

29 CFR 1910.157, Portable Fire Extinguishers.
29 CFR 1910.158, Standpipe and Hose Systems.
29 CFR 1910.159, Automatic Sprinkler Systems.
U.S. Department of Labor—OSHA,
29 CFR Parts 1900 to 1910, Revised July 1, 1993.
NFPA Standard #10, Portable Fire Extinguishers.
ANSI/UL 711 Rating and Testing of Fire Extinguishers.
National Fire Protection Association, *Fire Protection Handbook*, Sixteenth Edition. R.R. Donnelley & Sons.
National Safety Council, *Accident Prevention Manual for Industrial Operations*, Engineering and Technology, Ninth Edition. R.R. Donnelley & Sons.

American National Standards Institute (ANSI)

11 W. 42nd St.
New York, NY 10036
(212) 642-4900

National Fire Protection Association (NFPA)

1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269
(617) 770-3000

National Safety Council

1121 Spring Lake
Itosca, IL 60143-3201
1-800-621-7615

Underwriters' Laboratories (UL)

333 Pfingsten Rd.
Northbrook, IL 60062
(708) 272-8800

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