

# Fire Extinguisher Selection and Distribution

There are several different types and sizes of fire extinguishers (hereinafter referred to as “extinguishers”) available. Selection of the wrong type of extinguisher may result in ineffective fire control or expose the user to other hazards. This handout provides general guidance on selecting and distributing extinguishers.

## Determining Hazard Class

There are five primary classifications of fires identified within NFPA 10, Standard for Portable Fire Extinguishers, published by the National Fire Protection Association (NFPA). The first step in selecting an appropriate extinguisher is to determine the likely type of fire hazards that are present.

Fire hazards are divided into five classes:

1. **Class A:** fires occurring in ordinary combustible materials, such as wood, paper, and plastic.
2. **Class B:** fires occurring in flammable and combustible liquids and flammable gasses.
3. **Class C:** fires occurring in energized electrical equipment, such as panel boxes, motors, and fans.
4. **Class D:** fires involving combustible metals, such as potassium and magnesium.
5. **Class K:** fires involving cooking greases and fats.

## Selecting the Extinguisher Type

Once the fire hazard(s) has been identified, an extinguisher, which is suitable for the class(es), can be selected. If there may be more than one fire hazard present in a particular area, it is important to select an extinguisher that can control all of the hazards present, if possible. When this is not possible, care should be taken to avoid selecting a fire extinguisher that specifically cannot be used on a hazard that is present.

Manufacturers provide the rating (i.e., the class of fire for which an extinguisher is suitable) for an extinguisher on a product label that is affixed to the extinguisher (e.g., an extinguisher that is rated BC would be suitable for Class B and Class C fires). When selecting an extinguisher, some important factors to consider include:

- Extinguishers intended for certain types of hazards may not be effective against fires of a different hazard class. For example, extinguishers rated BC will not be able to control a Class A fire.

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- Extinguishers intended for certain types of hazards may increase the fire severity when used against a fire of a different hazard class. For example, use of a water-based Class A extinguisher on a Class B fire may cause the petroleum fire to be spread out on top of the water.
- Extinguishers intended for certain types of hazards may expose users to personnel hazards when used against fires of a different hazard class. For example, use of a water-based Class A extinguisher on a Class C electrical fire creates a risk of shock or electrocution because of the conductivity of the water.
- Extinguishers rated for multiple fire hazards may have different levels of effectiveness for each hazard. For example, while ABC fire extinguishers are highly effective on Class B and C fires, they have limited effectiveness on Class A fires.
- Class D extinguishers are designed to control fires involving specific metals or metal groups. An extinguisher that may be highly effective in one type of metal fire may be ineffective or actually dangerous on another type of fire. As such, the selection of Class D extinguishers requires a close attention to the types of metals present.
- Class K extinguishers are used to control kitchen fire exposures. While other classes of extinguishers may provide some fire control, Class K extinguishers are designed to control fires in grease and fats, which typically are difficult to control using “conventional” ABC extinguishers.

### **Sizing the Extinguisher**

The final step is to select an appropriately sized extinguisher. Different rating methods are used for different hazard classes. Considerations for selecting the proper size extinguisher include:

- Extinguisher weight and the ability of the occupants to carry it.
- The size of the anticipated fire hazard.
- Special requirements for a target hazard or as required by fire protection codes.

Extinguisher ratings typically are presented using a series of numbers and letters, such as 2A10BC. This rating system is designed to provide the user with information relating to the classification of fire (i.e., A, B, or C) the extinguisher is suitable for and its relative effectiveness (e.g., a number).

### **Class A**

The number ratings for a Class A extinguisher compares the effectiveness of the extinguisher to that of 1 gal (3.8 L) of water on a small pile of wood. For example, a 2A extinguisher can extinguish twice as much fire as a 1A extinguisher, which is equal to that of 1 gal (3.8 L) of water.

### **Class B**

The number ratings for Class B extinguishers are based on actual fire testing. The number(s) represents the square footage of an ignited flammable liquid fire that the extinguisher can be expected to safely control, when used by a trained person (e.g., 2BC means the extinguisher can control 2 ft (0.6 m) of a flammable liquid fire).

## Class C, D, and K

Class C, D, and K extinguishers do not have numeric ratings.

### Distribution of Fire Extinguishers

While code requirements may vary from state to state and within individual communities, NFPA 10 does provide requirements for the mounting and distribution of extinguishers. Some of the more common requirements include:

- Extinguishers should be located along normal travel paths, including exit paths, and be visible, readily accessible and immediately available.
- Extinguishers 40 lb (18 kg) or less in weight should be mounted so that the top of the extinguisher is no more than 5 ft (1.5 m) above the floor.
- Extinguishers in excess of 40 lb (18 kg) in weight should be mounted so that the top of the extinguisher is no more than 3 ft (1.0 m) above the floor.
- The maximum travel distance to an extinguisher protecting Class A or Class D hazards should not exceed 75 ft (22.8 m).
- The maximum travel distance to an extinguisher protecting Class B hazards should not exceed 50 ft (15.2 m). NFPA 10 does provide for shorter travel distances under special circumstances.
- The maximum travel distance to an extinguisher protecting Class C hazards should not be greater than the distance for the appropriate hazard class (i.e., A or B) that would be present if the equipment was not “energized.” The maximum travel distance to an extinguisher protecting Class K hazards should not be greater than 30 ft (9.1 m).

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