



A DIVISION OF WESCO DISTRIBUTION, INC.

## **Fire Safety Ready Reference**

Updated 10/2018

### **1. The Law**

#### **A. OSHA 1910.157(d)**

- OSHA requires that portable fire extinguishers be provided for employee use and selected/distributed based on the classes of the anticipated workplace fires and on the size and degree of hazard which would affect their use.

#### **B. NFPA 10 (2002 Edition)**

- NFPA 10 specifies the requirements for the size, number, and location of fire extinguishers. Under NFPA 10 the distribution of fire extinguishers depends upon several factors, including the hazard classification of the area being protected, the size of the area, and the travel distance to the nearest extinguisher.

#### **C. ANSI/UL 711 – Rating and Testing of Fire Extinguishers**

- All fire extinguishers must be listed and labeled by an independent testing laboratory, such as Underwriters Laboratory (UL) or FM Factory Mutual (FM).

#### **D. State Building Codes – Smoke and CO Detectors**

- Hard-wired AC smoke detectors are required by building codes in all new construction
- Customer should check with their local authorities regarding requirements for CO detectors
- NFPA mandates 10-year replacement for all detectors

### **1. The Essentials**

#### **A. What Are the Classifications of Fires?**

##### **Class A**

- Class A fires involve common combustibles, such as wood, paper, cloth, rubber, trash, and plastics
- They are common in typical commercial and home settings
- The Class A fire extinguisher can be identified with a green triangle and the letter A inside it

##### **Class B**

- Class B fires involve flammable liquids' gasses, solvents, oil, gasoline, paint, lacquers, tars, and other synthetic or oil-based products
- They often spread rapidly and, unless properly secured, can reflash after the flames are extinguished
- The Class B fire extinguisher can be identified with a red square and the letter B inside it

##### **Class C**

- Class C fires involve energized electrical equipment, such as wiring, controls, motors, data processing panels, or appliances
- They can be caused by a spark, power surge, or short circuit and typically occur in locations that are difficult to reach and see
- The Class C fire extinguisher can be identified with a blue circle and the letter C inside it

**Class D**

- Class D fires involve combustible metals, such as magnesium, sodium, potassium, sodium potassium alloys, uranium, titanium, and powdered aluminum
- Combustible metal fires are unique industrial hazards which require special dry powder agents that do not react with the burning metal
- A Class D fire extinguisher can be identified with a yellow five-point star and the letter D inside it

**Class K**

- Class K fires involve combustible cooking media such as oils and grease commonly found in commercial kitchens
- This extinguisher works on the principal of saponification. Saponification takes place when alkaline mixtures are applied to burning cooking oil or fat. The alkaline mixture combined with the fatty acid create a soapy foam on the surface which holds in the vapors and steam and extinguishes the fire
- This extinguisher is identified by the letter K

**B. What Are the Basics of Fire Extinguisher Labeling?**

**Pictograms**

- Pictograms are labeled on fire extinguishers for a quick identification of the classes of fire the extinguisher is effective. For instance, a Type A extinguisher has a pictogram showing burning wood and fire coming out of a trashcan.
- Pictograms are also used to show what not to use. For example, a Type A extinguisher will show a pictogram of an electrical cord and outlet with a big slash through it.

**UL Rating**

- Fire extinguishers also have a UL rating that is a numerical rating that allows a customer to compare the relative extinguishing effectiveness of various fire extinguishers and is broken down into Class A and Class B:C. For example, an extinguisher that is rated 3-A:40-B:C indicates the following:
  - The A rating is a water equivalency rating. Each A is equivalent to 1¼ gallon of water. Therefore, 3-A = 3¾ gallons of water equivalence.
  - The B:C rating is equivalent to the amount of square footage that the extinguisher can cover. 40-B:C = 40 square feet of coverage.
  - The C indicates that the extinguisher is suitable for use on electrically energized equipment and does have a method to compare effectiveness in handling electrical type fires.

**C. What Are the Spray Times and Distances for Fire Extinguishers?**

| Extinguisher Size | Amerex     | Kidde       |
|-------------------|------------|-------------|
| 2.5 lb.           | 10 seconds | 9.5 seconds |
|                   | 9 – 15'    | 10 – 15'    |
| 5 lb.             | 14 seconds | 14 seconds  |
|                   | 12 – 18'   | 12 – 18'    |
| 10 lb.            | 20 seconds | 22 seconds  |
|                   | 15 – 21'   | 16 – 20'    |
| 20 lb.            | 30 seconds | 28 seconds  |
|                   | 15 – 21'   | 16 – 20'    |

- For additional information on other models of extinguishers and their spray time, visit the following sites to observe the various product data sheets for the extinguishers:

- [Amerex](#)
- [Kidde](#)

## D. What Are the Extinguishing Agents Used in Fire Extinguishers?

### Multipurpose Dry Chemical

- 70% of the market is dry chemical extinguishers
- Primary base component is Ammonium Phosphate
- Can leave a residue and cause corrosion (over time), so this category of extinguisher is commonly avoided for use in kitchens and vehicles
- Works by smothering the fuel, preventing vapors igniting and interrupting the chemical chain reaction
- Class A, B, and C extinguishing capability

### Regular Dry Chemical

- Primary base component is Sodium Bicarbonate
- Commonly used as an auto extinguisher or for use in kitchens, as it does not leave a residue like the ammonium phosphate, but it can corrode metal over time
- Works by smothering the fuel, preventing vapors igniting, and interrupting the chemical chain reaction
- Class B and C extinguishing capability

### Carbon Dioxide

- This is CO<sub>2</sub> gas under pressure, so it comes out very cold
- Works by taking away the oxygen that is supporting the fire
- Class B and C extinguishing capability

### Halotron

- Similar to Halon, only much safer for the atmosphere
- Halotron is a Clean Agent HydroChloroFluoroCarbon discharged as a rapidly evaporating liquid which leaves no residue
- Is ideal for use in computer rooms, telecommunications facilities, clean rooms, data storage areas, boats, vehicles, or anywhere where electronic equipment is used
- Works by cooling, smothering, and interrupting the chemical chain reaction
- Class B and C extinguishing capability

### Water

- We can special order water fire extinguishers that are simply filled to a certain level and then pressurized with an air hose
- Commonly used by maintenance and repair employees performing torching or welding
- Works by absorbing the heat and cooling the burning material
- Class A extinguishing capability

### Purple K Chemical

- Primary base component is Potassium Bicarbonate, so it's similar to Regular Dry Chemical
- Commonly used in kitchen applications to avoid corrosion issues involved with extinguishers
- Class B and C extinguishing capability

### Wet Chemical

- Primary based component is Potassium Acetate
- Class K extinguishing capability

## E. Where Should My Fire Extinguisher Be Located?

- OSHA requires that employers select and distribute fire extinguishers based on the classes of any anticipated workplace fires. Consideration is also given to the size and degree of the hazard which would affect the extinguishers' use.

- The following list contains OSHA requirements for classes of fires and travel distance to an extinguisher. Some local requirements could be stricter, so a customer should always verify with their local fire marshal and insurance agent.
  - **Class A Fire\*** – 75' or less travel distance
  - **Class B Fire** – 50' travel distance
  - **Class C Fire** – Based on appropriate A or B hazard
  - **Class D Fire** – 75' travel distance

**1926.150(c)(1)(i)**

A fire extinguisher, rated not less than 2A, shall be provided for each **3,000 square feet** of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher **shall not exceed 100 feet**.

**1926.150(c)(1)(iv)**

**One or more fire extinguishers, rated not less than 2A, shall be provided on each floor.**

In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

**1926.150(c)(1)(vi)**

A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

- \*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.

## **F. What Do I Need to Know About Fire Extinguisher Inspections?**

- Portable fire extinguishers must be visually inspected monthly. The inspection should assure that:
  - Fire extinguishers are in their assigned place
  - Fire extinguishers are not blocked or hidden
  - Fire extinguishers are mounted in accordance with NFPA Standard 10
  - Pressure gauges show adequate pressure. CO2 extinguishers must be weighed to determine if leakage has occurred.
  - Pin and seals are in place
  - Fire extinguishers show no visual sign of damage or abuse
  - Nozzles are free of blockage
  - Fire extinguisher inspection tags should be in place
- Maintenance should be done at least annually or more often if conditions warrant. The term maintenance involves disassembly, inspection, and a complete examination of the unit.
- Hydrostatic testing of extinguishers is done to protect against unexpected in-service failure. This process involves pressurizing the empty cylinder and verifying the integrity of the cylinder for reuse. In-service failure can be the result of internal or external corrosion, damage from abuse, etc. Hydrostatic test intervals can be after either 5 or 12 years, depending on the type of extinguisher (see Table 1 of 1910.157).

## **G. What Are the Basics of Using a Fire Extinguisher?**

- There is a simple acronym to remember to operate most fire extinguishers called PASS
  - **Pull** the pin at the top of the cylinder. Some units require you to release a lock latch or press a puncture lever.
  - **Aim** the nozzle at the base of the fire
  - **Squeeze** or press the handle
  - **Sweep** the contents from side to side at the base of the fire until it goes out
  - Shut off the extinguisher and then watch carefully for a rekindling of the fire

## **H. What Are the Basics of Smoke Alarms?**

- Working smoke alarms can reduce fire fatalities by 90%
- 60% of failed smoke alarms cases are due to no battery or dead battery
- Smoke alarms have a life between 4-12 years, with an average of 7 years

#### **Ionization Alarm**

- Best at detecting fast flaming fires that release millions of ions and only small particles of smoke
- Most common and least expensive option

#### **Photoelectric Alarm**

- Best at detecting slow, smoldering fires that produce large particles of smoke

#### **Dual Sensor Alarm**

- Contains both types of sensors for the quickest response to a fire

### **I. What Are the Basics of Carbon Monoxide (CO)?**

- CO is a colorless, odorless, toxic gas
- It is a product of incomplete combustion from gasoline, propane, natural gas, oil, wood, and coal
- It inhibits the blood's capacity to carry oxygen
- It can kill in minutes or hours
- It is the #1 cause of poisoning in the U.S.
- Anyone exposed to average CO levels of 50 ppm for an 8 hour period is at risk
- CO comes from:
  - Any fuel burning appliance that is malfunctioning
  - Vehicles and other combustion engines
  - Backdrafting and changes in air pressure

### **3. Product Reference**

- A. Fire Blankets
- B. First Aid Kits
- C. Emergency Escape Ladders
- D. Smoke Alarms
- E. Carbon Monoxide Detectors
- F. Water Jel Burn Dressings and Kits
- G. Emergency Lighting
- H. Emergency Exit Signs
- I. Glow-in-the-Dark Tape
- J. Fire Extinguisher Inspection Tags