

SAFETY MATTERS

RISK MANAGEMENT NEWSLETTER

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FIRE EXTINGUISHER SAFETY

OBJECTIVE To educate your organization on proper use of fire extinguishers to reduce risk for mild respiratory, skin, or eye irritation. Use in areas with poor air flow, use with intent to harm someone, or intentional inhalation of fire extinguishers can produce serious toxicity and would require medical evaluation.

Today's portable fire extinguishers are pressurized canisters that release a variety of fire suppressants including powders, gases, and water.

Most fire extinguishers should be operated using the PASS technique:

Pull out the safety pin

Aim the extinguisher at the base of the fire

Squeeze the handle

Sweep the spray from side to side



FIRE PREVENTION WEEK IS OCT. 6-12



TYPES OF FIRE EXTINGUISHERS

In the U.S., fires have five main classifications, and fire extinguisher ratings are based on the fire they intend to put out.

- Class A fires involve ordinary materials that easily burn, such as paper, cloth, and some plastics.
- Class B fires are from flammable liquids such as gasoline, non-cooking oils, solvents, and alcohols.
- Class C fires involve electrical equipment such as appliances, computers, and power tools that are plugged into a live/hot electrical outlet.

Typical household fires are usually class A, B, or C.

- Class D fires involve combustible metals such as lithium, titanium, and zirconium and are associated with manufacturing facilities.
- Class K fires are due to cooking oils and grease used in deep fat fryers in commercial kitchens.

This article will focus on portable fire extinguishers typically found in homes and offices.

FIRE EXTINGUISHERS WITH MULTIPURPOSE DRY CHEMICAL

Many fire extinguishers release a fine powder. The most common is the multipurpose dry chemical type, which is used for Class A, B, and C fires. These contain monoammonium phosphate, which comes out as a yellow powder. The yellow color helps to distinguish it from other non-multipurpose extinguishers. Ordinary dry chemical extinguishers are used for Class B and C fires only. They often contain sodium bicarbonate (baking soda), which comes out as a white powder.

Inhalation of monoammonium phosphate and sodium bicarbonate can cause mild irritation to the nose, throat, and lungs and results in symptoms like shortness of breath and coughing. Dizziness and headache are also possible. These symptoms usually resolve quickly with fresh air. Ongoing minor irritation often improves after a steam treatment, such as a steamy shower.

CASE STUDY A school nurse called Poison Control because a child sprayed an ABC-rated fire extinguisher toward several students and teachers. Some of them had shortness of breath and coughing while others had nausea, headaches, or irritated eyes. Poison Control instructed the nurse to have everyone get fresh air and to rinse the eyes of anyone with redness or irritation. Poison Control determined that the extinguisher contained monoammonium phosphate and only mild, brief effects were anticipated. A follow-up call to the nurse was made later in the day, and the teachers and students were all okay.

People with lung conditions like asthma or someone deliberately sprayed at close range can have more serious respiratory effects and might need medical attention. Contact of these powders with the eyes, nose, throat, and skin can cause irritation, which should improve after rinsing the exposed area. Deliberate inhalation or ingestion can cause serious symptoms such as pneumonia, seizures, irregular heartbeat, and kidney failure. People with more than mild symptoms or anyone with a deliberate exposure should be managed in a health care facility.





FIRE EXTINGUISHERS WITH CARBON DIOXIDE

Carbon dioxide (CO₂) fire extinguishers are used for Class B and C fires. They emit pressurized CO₂ gas, smothering the fire by blocking the oxygen it needs. Unlike the dry chemical types, this nonflammable gas quickly evaporates, leaving nothing behind. Because the gas is under pressure, pieces of dry ice (solid CO₂) might be emitted. CO₂ is not to be confused with carbon monoxide. **Carbon monoxide** is a very toxic gas that is generated by burning fuels and can be produced by faulty gas appliances, car exhaust, and fires. CO₂ is a naturally occurring gas and part of our air. CO₂ is also found in carbonated beverages.

Toxicity from inhaled CO₂ only occurs with very high concentrations. In most situations, there is enough oxygen in the area to prevent toxicity. However, toxicity can occur if a CO₂ extinguisher is used in a small, poorly ventilated area. Inhalation of concentrated CO₂ causes the same symptoms as not having enough oxygen, including difficulty breathing, dizziness, and loss of consciousness. Anyone exposed to concentrated CO₂ should seek fresh air immediately. Medical attention would be needed for effects that do not resolve quickly or for anyone who loses consciousness. Direct contact of the skin with the pressurized CO₂ can cause frostbite. The damage to the skin can be limited to mild redness, but blisters are also possible. Damage to the eyes can also occur with direct exposure.

If you suspect someone has inhaled spray from a fire extinguisher, get them to fresh air immediately. Exposure of the eyes or skin to any of the dry chemical fire extinguishers should be treated by immediate rinsing of the affected areas. After this initial treatment has been performed, check the **webPOISONCONTROL®** online tool for guidance or call Poison Control at 1-800-222-1222.



RESOURCES

- [U.S. Fire Administration - Choosing and Using Fire Extinguishers](#)
- [OSHA - Evacuation Plans and Procedures](#)
- [Poison Control - Fire Extinguisher Safety](#)

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This California Schools JPA Safety Matters fact sheet is not intended to be exhaustive. The discussion and best practices suggested herein should not be regarded as legal advice. Readers should pursue legal counsel or contact their insurance providers to gain more exhaustive advice.

