

Preventing Explosions

There's a risk of explosion when working with explosives, reactive or unstable chemicals and pressure vessels. Many explosions occur when gases are exposed to sources of heat or an increase in pressure. Some chemicals can even explode if exposed to water or air. By understanding the materials and the factors that trigger an explosion, you can help prevent this dangerous workplace emergency.

Categories of Explosives

Explosives can be classified into three categories according to level of hazard:

Class A explosives, the most powerful, include dynamite and nitroglycerin.

Class B explosives include such substances as propellants and flash powders.

Class C explosives are usually manufactured materials that contain small amounts of Class A or B explosives, such as fireworks.

Chemicals

The majority of explosive hazards found at the worksite involve chemicals that aren't classed as explosives but can be explosive under certain circumstances. The following materials and situations can be dangerous:

- ☀ explosive vapors, which can be ignited by a spark, friction or heat
- ☀ flammable vapors in confined areas
- ☀ reactive chemicals such as oxidizers, which can ignite when mixed with or stored near certain other chemicals or explode when exposed to air or water
- ☀ pressure vessels, such as compressed-gas cylinders or steam boilers, when there's a rupture or valve failure
- ☀ old chemicals that may undergo changes, making them increasingly unstable

Know the Hazards

Since explosions can occur under many different circumstances, it's important to know about the chemicals you work with. Read the MSDS for the chemicals you use, and be sure you understand the flash point and upper and lower explosion limits for volatile chemicals. If necessary, ask your supervisor to explain these numbers to you. These numbers tell you what ranges of temperature and concentration are safe to work with.

- ☀ Learn what substances are incompatible with each chemical and whether the chemical may be safely exposed to air, water or combustible materials.
- ☀ Be especially cautious when working in confined spaces.
- ☀ Treat any buildup of heat in the container or surrounding air as a danger signal.
- ☀ Report any defects or damage to containers.
- ☀ Ventilate properly.
- ☀ Clean up spills, dust and oily rags.
- ☀ Stay alert for leaks and other dangers.

Store Explosive Materials Safely

- ☀ Explosives are generally stored in areas called "magazines" posted with signs reading "Explosives—Keep Off."
- ☀ Keep explosive storage areas clean and dry and accessible to emergency equipment.
- ☀ Keep possible explosives away from heat sources.
- ☀ Use only approved storage and transfer containers.
- ☀ Store packages of explosives flat, following "This Side Up" directions, and rotate stock, using the oldest first.
- ☀ A permit is usually required to store black powder, which must be kept separate from other explosives.
- ☀ Never smoke, light matches or use spark-producing tools near explosives or within 50 feet of an explosives magazine.
- ☀ Follow MSDS guidelines when storing incompatible or flammable chemicals.
- ☀ Unstable chemicals and explosives that have exceeded their expiration dates should be disposed of, by professionals trained to handle them.

If There's an Explosion:

- Follow your company emergency plan.
- Evacuate quickly.
- Close windows and doors behind you.
- Report the explosion and its circumstances to your emergency response coordinator.
- Stay upwind.