



## GOALS

### This safety session teaches employees to:

- Be aware of substances and conditions that could cause explosions.
- Know basic precautions to follow to prevent explosions.

**Applicable Regulations: 29 CFR 1910.106, .109, .110, .119, .1200**



### 1. Know what materials and substances have the potential to explode.

- Explosives like dynamite and blasting caps can go off accidentally.
- Some flammable materials can explode under pressure or if sparks or friction ignite their vapors or gases.
- A rupture or valve failure can cause an explosive pressure release in cylinders or large pressure vessels that contain compressed gases.
- Some chemicals can explode if exposed to incompatible substances, air, heat, or water.

The Occupational Safety and Health Administration (OSHA) has detailed storage requirements for explosives like dynamite.

- OSHA requires separate buildings or areas, with construction and/or placement that varies by hazard level.

— Class A, the most hazardous, includes dynamite and nitroglycerin.

### 2. Flammable substances can explode if they're stored or handled improperly.

- Check labels and safety data sheets (SDSs) to determine explosion potential.
- Flash point is the lowest temperature at which a flammable liquid's vapors could ignite.
- Upper and lower flammability or explosive limits (UFL, UEL, LFL, LEL) are the minimum and maximum amounts of vapor and gas in the air that won't explode.
  - Staying below the lower limit or above the upper one reduces explosion risk.
  - An increase in pressure or temperature can increase the explosion risk.
- An incompatible substance may explode if mixed or stored with particular other substances or if exposed to heat, air, or water.

### 3. Be alert to other equipment and substances that can cause explosions.

- Overheated, poorly maintained, or sparking machinery;
- Confined spaces with inadequate ventilation;
- Dust buildup in grain silos or similar areas;
- Stuck boiler relief valves;
- Oil leaks soaking into flammable materials; *and*
- Static electricity or sparks from tool or machine friction.

### 4. Practice storage and handling precautions that prevent explosions.

- Don't expose explosives to heat sources or let heat build up in the air or in containers.
- Properly ventilate areas containing explosives or flammables.



- Store explosives in approved containers in clean, ventilated areas.
  - Follow SDS instructions on avoiding heat or incompatible substances.
- Be sure cylinders and pressure vessels have safety relief devices to vent or release dangerous pressure buildup.
- Avoid air or heat exposure when transferring explosives to new containers.
  - Be sure containers used to transfer flammables are grounded.
- Don't keep explosives like dynamite past their shelf-life dates.
  - They need professional disposal according to safety laws.
- Dispose of flammables properly, not on the ground or in sewers.
  - Place oily rags and other flammable waste in closed metal containers.
- Clean up spills of possible explosives quickly.
  - Remove heat and ignition sources from the area.
- Don't smoke in or around any area that contains explosives or flammables.

## 5. Maintain equipment to prevent explosions.

- Prevent overheating, leaks, and sparks.
  - Watch out for carbon buildup, corrosion, stress, and weak connections.
- Choose grounded electrical equipment that's approved for use around explosives.
- Report any equipment problems immediately.

## 6. React quickly and properly if there's an explosion.

- Call in an alarm immediately so professionals can handle the problem.
- Leave the area immediately, following your assigned evacuation route.
  - Tell others to get out as you leave.
  - Close doors and windows behind you to contain the problem.

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### **DISCUSSION POINTS:**

- Ask for examples of potential explosives used in your work area.
- Ask what explosion precautions employees now take and what they'll now add.

### **CONCLUSION:**

- Explosions can be large and dangerous accidents.
- Know what could explode in your work area and under what conditions. Follow all handling and storage precautions to prevent the worst from happening.

### **TEST YOUR KNOWLEDGE:**

Have your employees take the Explosion Prevention quiz. By testing their knowledge, you can judge their ability to prevent explosions and whether they need to review this important topic again soon.



## EXPLOSION PREVENTION QUIZ

- Only materials like dynamite can explode.**
  - True
  - False
- Dynamite and nitroglycerin can be stored in any ventilated area.**
  - True
  - False
- Explosion information on safety data sheets may be found in:**
  - Health hazard data
  - Upper and lower flammable or explosive limits
  - Both a and b
- Flash point is:**
  - The lowest temperature at which a flammable liquid's vapors could ignite
  - The lowest temperature at which a flammable liquid becomes a solid
  - The highest temperature that's permitted in a room with chemicals
- One way to reduce the risk of explosions is to:**
  - Keep dynamite in a locked locker.
  - Avoid exposing explosives to heat sources.
  - Handle explosives only with wet hands.
- To prevent dangerous pressure buildup in compressed gas cylinders or pressure vessels, they're equipped with:**
  - Safety relief devices
  - Chemical labels
  - Fans
- Smoking is forbidden in or around areas with explosives and flammables.**
  - True
  - False
- Equipment that overheats, sparks, or creates friction could cause an explosion.**
  - True
  - False
- Any electrical equipment in good condition can be used around explosives.**
  - True
  - False
- Explosions are best handled by:**
  - The closest employees
  - Trained professionals
  - Managers

When you have completed this quiz, turn it in to your supervisor.

Name: \_\_\_\_\_

Date: \_\_\_\_\_



## ANSWERS TO EXPLOSION PREVENTION QUIZ

1. b. False. Various chemicals and flammable liquids can explode in certain circumstances.
2. b. False. They must be stored in separate buildings or areas that meet the Occupational Safety and Health Administration (OSHA) safety requirements.
3. b. Upper and lower flammable or explosive limits.
4. a. The lowest temperature at which a flammable liquid's vapors could ignite.
5. b. Avoid exposing explosives to heat sources.
6. a. Safety relief devices.
7. a. True.
8. a. True.
9. b. False. It must be grounded and approved for use around explosives.
10. b. Trained professionals.