

# 2 - Battery Hazards: Safety Training

EH&S – MGA

**Goals: This safety session should teach you:**

- A. That batteries have many hazards including acid, fire or explosion, electrical shock, and heavy weight
- B. That following safety precautions will keep them safe when charging or changing batteries

**OSHA regulations: 29 CFR 1910.178(g), 1910.305(j)(7), 1917.157, and 1926.441**

**1. There are four main hazards associated with batteries:**

- A. **Battery acid:** The electrolyte in a battery is corrosive and can burn skin or eyes, eat holes in clothing, or even etch a concrete floor.
- B. **Flammable gases:** Batteries emit hydrogen gas, which is flammable. It ignites easily and can cause a fire or explosion if allowed to accumulate in a small area.
- C. **Electrical shock:** Many of us are aware of this danger because we may have seen sparks fly when jumper cables are attached to a car battery.
- D. **Weight:** Batteries, like those used in forklifts, are heavy and require proper material handling equipment to lift them safely.

**2. To protect themselves when working with batteries, workers need to use the proper personal protective equipment (PPE).**

- A. **Goggles:** Eyes need protection from electrolyte splashes.
- B. **Face shield:** Skin needs acid protection as well.
- C. **Rubber gloves:** They provide both acid protection and electrical resistance to prevent shocks.
- D. **Rubber apron:** Workers' clothes and bodies need the same protection.

**3. A battery consists of a number of cells, each with a positive (+) and a negative (-) plate.**

- A. Both plates are immersed in a solution of sulfuric acid and water called an electrolyte.
- B. Each battery cell can produce about 2 volts of power.
- C. Each cell has its own vent cap, designed to allow gases to escape and keep the electrolyte solution from spilling.
- D. When the battery is used (discharged), the acid level becomes weaker until the battery cannot produce an electrical current.
- E. Then the battery needs to be charged by connecting the terminals to a battery charger (an AC source of electricity).
- F. Charging restores the acidity of the electrolyte so the battery can again produce an electrical current.

**4. Recharging should be done only in a location specifically designed for that purpose. The following features are needed:**

- A. Adequate ventilation to disperse fumes given off during charging
- B. “No Smoking” area
- C. Elimination of open flames, sparks, welding, and electric arcs
- D. Fire protection equipment, such as fire extinguishers, nearby
- E. Equipment and materials for absorbing spilled electrolyte
- F. Emergency shower and eyewash stations in case of an electrolyte splash

**5. Follow these safety procedures for charging batteries safely:**

- A. Be sure the proper charger is being used for the particular kind of battery.
- B. Check that vent caps are in place to prevent overflow and spilling of electrolyte.
- C. Shut off the charger when connecting or disconnecting the battery.
- D. Before charging a battery while it is still in a forklift, open the battery compartment and allow it to cool down following lift truck operation.
- E. After charging, again allow the battery to cool down—it prolongs battery life.
- F. Never overcharge a battery—that’s another way to prolong battery life.

**6. Know what to do in an emergency.**

- A. Have an emergency kit with corrosion-resistant plastic tools and materials to absorb acid liquids. Don’t forget to use your PPE!
- B. Baking soda is commonly used to neutralize electrolyte spills.
- C. All workers should know how to operate fire extinguishers properly.
- D. For contact with a worker’s skin or eyes, rinse immediately for at least 10 minutes and then seek medical attention.

**Summation:**

Many accidents are caused when workers are unclear about safe procedures but are embarrassed to ask questions. Make sure your trainees understand the importance of asking if there is any part of this information that is not clear. Understanding battery safety is the way they can protect themselves from serious injury.