Battery Charging – Fact Sheets

WHAT ARE THE RISKS IN CHARGING AN INDUSTRIAL BATTERY?

The charging of lead-acid batteries can be hazardous. However, many workers may not see it that way since it is such a common activity in many workplaces. The two primary risks are from hydrogen gas formed when the battery is being charged and the sulfuric acid in the battery fluid.

For specific guidelines regarding large industrial batteries, check with the manufacturer for recommended safe work procedures.

Why is there a risk of an explosion?

When batteries are being recharged, they generate hydrogen gas that is explosive in certain concentrations in air (explosive limits are 4.1 to 72 percent hydrogen in air). The ventilation system can exchange an adequate amount of fresh air for the number of batteries being charged. This is essential to prevent an explosion. Also, no flame, burning cigarette, or other source of ignition should be permitted in the area.

Why can you get a burn from acid when handling the batteries?

You can get a skin burn when handling lead-acid batteries. Sulfuric acid is the acid used in lead-acid batteries and it is corrosive. If a worker comes in contact with sulfuric acid when pouring it or when handling a leaky battery, it can burn and destroy the skin. It is corrosive to all other body tissues. For example, the eyes, respiratory tract, or digestive system can be harmed severely if a worker gets a splash in the eyes, inhales sulfuric acid mist or accidentally ingests sulfuric acid. As with any corrosive chemical, proper handling procedures must be followed to prevent contact with the liquid. These procedures include the wearing of gloves, face and eye protection, and aprons that are suitable for protecting you from contact with sulfuric acid. As well, adequate first aid facilities, eye wash stations, and emergency showers are necessary to reduce the severity of accidental contacts.

- If contact with acid occurs, flush the area (eyes, skin) immediately for at least 30 minutes with clean, lukewarm, gently flowing water.
- If irritation persists, repeat flushing.
- DO NOT INTERRUPT FLUSHING. If necessary, keep the emergency vehicle

waiting.
- Take care not to rinse contaminated water into the unaffected eye or onto the face.
- First aiders should avoid direct contact. Wear chemical protective gloves, if necessary.
- Quickly transport the victim to an emergency care facility.

Are there any other hazards involved in batteries charging?

Depending on the metal alloy composition in lead-acid batteries, a battery being charged can generate two highly toxic by-products. One is arsine (arsenic hydride, AsH_3) and the other is stibine (antimony hydride, SbH_3). Generally, the air levels of these metal hydrides tend to remain well below the current occupational exposure limits during battery charging operations. However, their possible presence re-enforces the need for adequate ventilation systems.

How should industrial size batteries be handled?

Industrial batteries (e.g., forklifts or battery powered industrial trucks) may weigh up to 900 kg (2,000 lbs) or more.

Workers must be trained in how to safely move batteries using appropriate equipment (e.g., specially equipped forklift, battery cart, conveyor, overhead hoist, etc.)

- Batteries must be securely placed and restrained.
- Use only the appropriate tools and follow safe work procedures.