
Forklift Battery Room Ventilation and Spill Kit Inspection

1.0 Objective & Intent

The objective of this Standard Operating Procedure (SOP) is to define the mandatory safety protocols for inspecting the ventilation system and spill containment kit in the forklift battery charging room. This procedure is designed to mitigate the risk of hydrogen gas explosion, acid burns, and environmental contamination, ensuring compliance with WorkSafeBC regulations (OHS Regulation Part 24 – Electrical Safety, and Part 5 – Chemical and Biological Substances). The specific risk addressed is the accumulation of explosive hydrogen gas during battery charging and the potential for uncontrolled electrolyte spills, which can cause severe injury or property damage.

2.0 Operational Scope

This procedure applies to all maintenance personnel, warehouse operators, and safety inspectors responsible for the forklift battery charging room at the cabinet and millwork manufacturing facility. It covers the daily inspection of the mechanical ventilation system (fans, ducts, and louvers) and the weekly inspection of the acid spill kit located within the battery room. This SOP does not cover battery watering or charging procedures, which are addressed in a separate SOP.

3.0 Hazard Identification & Mandatory PPE

- **Hydrogen Gas Explosion:** Hydrogen is produced during battery charging and is highly explosive at concentrations above 4% by volume. Inadequate ventilation can lead to a catastrophic explosion.
- **Sulfuric Acid Exposure:** Battery electrolyte is a corrosive acid that can cause severe chemical burns to skin, eyes, and respiratory tract upon contact or inhalation of mist.
- **Electrical Shock:** Battery terminals and charging equipment present a risk of electrical shock, especially if equipment is damaged or wet.
- **Slip/Trip Hazards:** Spilled acid or water on the floor creates a slippery surface, increasing the risk of falls.
- **CSA-Approved Safety Glasses with Side Shields** (mandatory at all times in the battery room)
- **Acid-Resistant Rubber Gloves** (e.g., neoprene or nitrile, rated for sulfuric acid)
- **CSA-Approved Steel Toed Rubber Boots** (acid-resistant, non-slip sole)
- **Chemical Splash Goggles** (to be worn over safety glasses when handling acid or inspecting spill kit)
- **Acid-Resistant Apron** (full-length, rubber or PVC, when handling spill kit contents)
- **Hard Hat** (if overhead equipment or battery handling is in progress)

4.0 Required Safety Equipment & Tools

- **Lockout/Tagout (LOTO) Kit** with personal lock and hasp (for isolating ventilation fan electrical supply if maintenance is required)
- **Four-Gas Atmospheric Monitor** (capable of detecting H₂, O₂, CO, and LEL – Lower Explosive Limit)
- **Spill Kit Inspection Checklist** (company-specific form or digital record in SafeDesk)
- **Ventilation System Inspection Log** (paper or digital)
- **Flashlight** (for inspecting dark corners of the battery room and ventilation ducts)
- **Non-Sparking Tools** (brass or plastic, for any adjustments near batteries)

- pH Test Strips (to verify neutralization of any minor spills)
- Emergency Eyewash Station (must be verified functional within 10 feet of the battery room entrance)

5.0 Step-by-Step Safety Procedure

1. **Pre-Inspection Notification:** Notify all personnel in the vicinity of the battery room that an inspection is in progress. Post a temporary warning sign at the entrance: 'INSPECTION IN PROGRESS – NO BATTERY CHARGING UNTIL COMPLETED'.
2. **Atmospheric Monitoring:** Before entering the battery room, use the four-gas monitor to check for hydrogen gas (H₂) levels. Ensure the reading is below 10% of the Lower Explosive Limit (LEL) – i.e., less than 0.4% H₂ by volume. If the alarm sounds, DO NOT ENTER. Immediately ventilate the room by opening external doors (if safe) and call for a qualified electrician to inspect the ventilation system.
3. **Visual Inspection of Ventilation System:** With the ventilation fan running, inspect the fan blades, motor housing, and ductwork for any signs of damage, corrosion, or obstruction. Verify that the intake and exhaust louvers are fully open and free of debris. Listen for unusual noises (grinding, squealing) that indicate bearing failure or belt slippage.
4. **Verify Airflow Direction and Volume:** Hold a piece of tissue paper or a smoke pencil near the intake louver to confirm inward airflow. Then check the exhaust louver for outward airflow. Use an anemometer if available to measure airflow velocity; the minimum required is 1.5 m/s (300 ft/min) at the exhaust point. Record the reading in the ventilation log.
5. **Inspect Emergency Eyewash Station:** Locate the eyewash station within the battery room or immediately outside. Activate the unit for 30 seconds to flush the lines and verify a steady, gentle flow of tepid water. Check that the dust covers are in place and that the unit is free of obstructions. Record the inspection date on the attached tag.
6. **Retrieve and Inspect the Spill Kit:** Open the spill kit container and verify the presence and condition of all required components: acid-resistant gloves, chemical splash goggles, absorbent pads (minimum 10 pads), neutralizer (sodium bicarbonate or commercial acid neutralizer), disposal bags, and a scoop/scrapper. Check expiration dates on any chemical neutralizers – replace if expired.
7. **Verify Spill Kit Accessibility and Integrity:** Ensure the spill kit is located within 10 meters of the battery charging area and is clearly marked with a sign. Confirm that the container is sealed and free of damage. If any components are missing or damaged, tag the kit as 'OUT OF SERVICE' and order a replacement immediately.
8. **Document and Report Findings:** Complete the Ventilation System Inspection Log and the Spill Kit Inspection Checklist. Include the date, time, inspector name, and any deficiencies found. If any critical deficiency is identified (e.g., fan not running, hydrogen detected, spill kit empty), immediately report to the Plant Safety Officer and do not allow battery charging until the issue is resolved.
9. **Restore and Sign Off:** Remove the temporary warning sign. Ensure the battery room is left in a clean, dry condition. If any adjustments were made to the ventilation system (e.g., louver position), confirm that the system is operating normally. Sign off the inspection in SafeDesk or the paper log, and notify the shift supervisor that the room is safe for use.

Regulatory Disclaimer: This document is a generic safety template provided for educational and informational purposes only. It does not constitute professional engineering, legal, or regulatory compliance advice. The end-user assumes all liability for validating all safety protocols against specific machinery manufacturer manuals and local occupational health and safety regulations (e.g., WorkSafeBC, CSA standards) before deployment.