

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 3

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PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 5184 to read:

~~§5184. Hazardous Mixtures. (Repealed)~~

§5184. Storage Battery Systems

(a) Scope and Application. This section applies to stationary storage battery systems having an electrolyte capacity of more than 50 gallons (189 L) for flooded lead-acid, nickel cadmium (Ni-Cd) and valve-regulated lead-acid (VRLA), or 1,000 pounds (454 kg) for lithium-ion and lithium metal polymer, used for facility standby power, emergency power or uninterrupted power supplies.

(b) Definitions. For the purposes of this section and section 5185, the following shall apply:

Battery System means a system which consists of three interconnected subsystems: a lead-acid battery, a battery charger, and a collection of rectifiers, inverters, converters, and associated electrical equipment as required for a particular application. [from CFC]

Nonrecombinant Battery means a storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are vented into the air outside of the battery. [from CFC]

Recombinant Battery means a storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are converted back into water inside the battery instead of venting into the air outside of the battery. [from CFC]

Stationary Storage Battery means a group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load, designed for service in a permanent location. The number of cells connected in a series determines the nominal voltage

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rating of the battery. The size of the cells determines the discharge capacity of the entire battery. After discharge, it may be restored to a fully charged condition by an electric current flowing in a direction opposite to the flow of current when the battery is discharged. [from CFC]

Thermal Runaway means a condition in a recombinant battery when the rate of internal heat generation exceeds the rate at which the heat can be dissipated into the environment. If the condition continues, the battery cells will dry out and the battery case can rupture or melt. [from “Thermal Runaway in VRLA Batteries – Its Cause and Prevention”, C&D Technologies Technical Bulletin]

Valve-regulated lead-acid (VRLA) battery means a lead-acid battery consisting of sealed cells furnished with a valve that opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount. In VRLA batteries, the liquid electrolyte in the cells is immobilized in an absorptive glass mat (AGM cells or batteries) or by the addition of a gelling agent (gel cells or gelled batteries). [from CFC]

(c) Storage battery systems shall meet the applicable requirements of Section 5185 as well as the requirements of this Section.

(d) Safety caps.

1. Nonrecombinant batteries. Vented lead-acid, nickel-cadmium or other types of nonrecombinant batteries shall be provided with safety venting caps, which shall be maintained in proper working order.
2. Recombinant batteries. VRLA batteries shall be equipped with self-resealing flame-arresting safety vents, which shall be maintained in proper working order.

(e) VRLA and lithium metal polymer battery systems shall contain approved equipment, devices and / or procedures which preclude, detect and control thermal runaway.

(f) An approved method and materials for the control and neutralization of a spill of electrolyte shall be provided in battery system areas containing lead-acid, nickel-cadmium or other types

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of batteries with free-flowing liquid electrolyte. Spills shall be neutralized to a pH between 5.0 and 9.0.

- (g) Doors into electrical equipment rooms or buildings containing stationary battery systems shall contain signs stating that the room contains energized battery and electrical systems. If the room contains batteries with electrolyte solutions, the signage shall also indicate that there are corrosive liquids inside.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 5185 to read:

(a) In addition to the requirements below, the changing and charging of batteries shall comply with applicable requirements of Section 5184.

~~(a)~~ Battery charging installations shall be located in areas designated for that purpose. Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.

~~(b)~~ The area shall be adequately ventilated to prevent concentrations of flammable gases exceeding 20 percent of the lower explosive limit, and to prevent harmful concentration of mist from the electrolyte where necessary.

~~(c)~~ Where corrosive liquids are regularly or frequently handled in open containers or drawn from reservoirs or pipelines, adequate means shall be provided to neutralize or dispose of spills and overflows promptly and safely.

~~(d)~~ Carboy tilter, siphon, hand-operated bulb or hand-operated pump shall be provided and used for dispensing electrolyte or acid where necessary.

~~(e)~~ Facilities shall be provided for protecting charging apparatus from damage by mobile equipment.

~~(f)~~ Appropriate mechanical lifting and material handling devices or equipment shall be provided for handling batteries.

~~(g)~~ Smoking shall be prohibited in the charging area.

~~(h)~~ Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas. When racks are used for support of batteries, they shall be made of materials nonconductive to spark generation or coated or covered to achieve this objective. Tools and other metallic objects shall be kept away from the top of uncovered batteries. Chargers shall be turned off when leads are being connected or disconnected.

~~(i)~~ Electrolyte (acid or base, and distilled water) for battery cells shall be mixed in a well ventilated room. Acid or base shall be poured gradually into the water while stirring. Water shall never be poured into ~~concentrated (greater than 75 percent)~~ acid solutions.

~~(j)~~ Mobile equipment shall be properly positioned and brake applied before attempting to change or charge batteries.

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(~~k~~l) When charging batteries, the vent caps shall be kept firmly in place to avoid electrolyte spray where such potential exists. Care shall be taken to assure that vent caps are functioning. The battery compartment cover(s) shall be open to dissipate heat.

(~~m~~n) Facilities for quick drenching or flushing of the eyes and body shall be provided in accordance with Section 5162. ~~unless the storage batteries are:~~

~~(1) equipped with explosion resistant or flame arrestor type vents; or~~

~~(2) located in a compartment or other location such as to preclude employee exposure.~~

EXCEPTIONS: Automotive servicing facilities and parts stores where:

1. A suitable neutralizing agent is available.

2. An adequate supply of clean water is readily available.

3. The transfer system is essentially a closed system and does not involve handling acid in open containers.

(~~m~~n) When taking specific gravity readings, the open end of the hydrometer shall be covered with an acid resistant material while moving it from battery to battery to avoid splashing or throwing the electrolyte.

(~~n~~o) Electrolyte shall only be placed in suitable containers and shall not be stirred with metal objects.

(~~p~~q) When a jumper battery is connected to a battery in a vehicle, the ground lead shall connect to ground away from the vehicle's battery. Ignition, lights and accessories on the vehicle shall be turned off before connections are made.

(~~p~~q) Vent caps shall be in place when batteries are being moved.

EXCEPTIONS: Portable equipment battery systems:

Batteries and battery charging equipment of less than 100 watt hours are exempt.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.