



Hazardous Materials: Battery Storage Systems

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Learning Objective: The student shall be able to summarize the fire code requirements for stationary battery systems installed in buildings.

As more and more computers and telecommunications systems are used in the workplace, there is a corresponding demand for reliable power supplies to protect critical and sensitive data. Stationary battery systems are a popular means of providing back-up power in the event of a primary power loss.

There are inherent hazards, though, with stationary battery systems. During lead-acid battery electrolysis, oxygen and hydrogen gases can be released into the atmosphere forming flammable mixtures. Nickel cadmium and lithium ion batteries can have a thermal runaway resulting in high temperature fires. Batteries can be a source of ignition or explode. Batteries also may contain corrosive materials.



The room for this stationary battery system must meet specific fire code requirements.

To address these concerns, the model fire codes provide specific requirements when large quantities of lead acid, nickel cadmium and lithium ion battery systems are used in buildings.

- Depending upon the battery type, caps to the providing access to the electrolyte must be safety venting caps or self-resealing flame-arresting caps.
- Depending upon the amount of electrolyte, the room in which the batteries are stored may have to be separated from the remainder of the building by fire resistant construction and be sprinklered.
- Smoke detection is required in battery storage rooms.
- An approved method and material for spill control and neutralization must be provided for areas containing lead-acid, nickel cadmium or other batteries that have free-flowing electrolytes.
- Battery storage rooms (except for lithium ion systems) must be ventilated
 - to limit the maximum concentration of hydrogen to 1 percent of the total room volume, or
 - by continuously operating mechanical ventilation at a rate of at least 1 cfm/ft³ (0.0051 L/sec/m²).
- Warning signs must be provided to make occupants aware of energized electrical equipment. You cannot easily de-energize these systems. Once a battery string is placed in service, the wiring between the positive and negative poles must be disconnected to render it from being a potential electrocution source.
- Seismic bracing for rack systems may be required depending upon the location.

Always refer to your legally-adopted fire code for additional and specific requirements. For additional information, refer to International Fire Code[®] Chapter 6, or NFPA[®] 1, Uniform Fire Code[®] Chapter 52.

