

Chapter E 114

STORAGE BATTERIES

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E 114.01 General. (1) The provisions of this chapter are intended to apply to all stationary installations of storage batteries using acid or alkali as electrolyte, consisting of cells connected in series, with a nominal voltage in excess of 50 volts, and connected for service where so installed. (For exception, see subsection E 114.03(2)).

(2) Nominal battery voltage shall be calculated on the basis of 2.0 volts per cell for lead-acid type and 1.2 volts per cell for alkali type. "End" or "Emergency" cells, held in reserve for connection into circuit only to maintain voltage during discharge, are not included in calculating nominal battery voltage.

(3) Two types of cell construction are recognized in this section, viz:

(a) The sealed type in which the only passage for the escape of gases from the interior of the cell is provided by a vent of effective spray-trap design adapted to trap and return to the cell, particles of liquid entrained in the escaping gases.

(b) The nonsealed type, in which gases escaping from the cell may carry entrained particles of liquid into the surrounding atmosphere.

Note: Caution: Smoking or the use of open flames, or of tools which may generate sparks, should be avoided except when cells are not actively gassing and when prior ventilation has been ample. Sparks from frictional or static electricity should be avoided as they may ignite the gas if discharged close to its source, as at the vent of a sealed-type cell during overcharging. The electrolyte of storage batteries, and spray containing electrolyte, are somewhat corrosive, particularly when concentrated by evaporation, and contact with body or clothes should be avoided.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.02 Isolation. Storage batteries should be so located as to be not accessible to other than properly qualified persons.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.03 Ventilation. (1) **DIFFUSION OF GASES.** Provision shall be made for sufficient diffusion of the gases from the battery to prevent the accumulation of an explosive mixture.

(2) **NONSEALED TYPE.** Batteries of the nonsealed type shall be located in separate rooms or enclosures so arranged as to prevent the escape into other rooms of objectionable quantities of electrolyte spray. This applies also to batteries of the nonsealed type not exceeding 50 volts nominal voltage if the capacity at the 8-hour discharge rate exceeds 5 kw. hrs.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.04 Insulation. (1) Cells of the nonsealed type shall be supported by suitable insulators such as glass, glazed porcelain, or oil type, or may be grouped and supported on glass or other suitable insulating trays.

(2) Cells of the alkali type in jars of conducting material shall be supported singly, or in groups assembled in nonconducting trays, on porcelain or other suitable insulators.

(3) Cells of the sealed type in containers of insulating material require no additional insulation except as follows:

(a) Cells in rubber or composition containers if the total voltage exceeds 150 volts, or cells in glass jars if the total voltage exceeds 250 volts, should preferably be sectionalized into groups not exceeding these voltages, and such groups shall be mounted on trays or racks supported by suitable insulators such as glass, glazed porcelain, or oil type.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.05 Racks and trays. (1) **RACKS.** Racks as required in this section, refer to frames designed to support cells or trays. They shall be substantial and made of:

(a) Wood, so treated as to be resistant to deteriorating action by the electrolyte; or

(b) Metal, so treated as to be resistant to deteriorating action by electrolyte and provided with nonconducting members directly supporting the cells; or with suitable insulating material on conducting members; or

(c) Other similar suitable construction.

(2) **TRAYS.** Trays refer to frames such as crates or shallow boxes usually of wood or other nonconducting material so constructed or treated as to be resistant to deteriorating action by the electrolyte.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.06 Floors. It is recommended that the floors of battery rooms in which large batteries comprised of cells in lead-lined wood tanks are installed be of acid-resistive material, or be painted with acid-resistive paint, or otherwise be protected, where acid is likely to drop and accumulate.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.07 Wiring in battery rooms. Wiring shall be in accordance with the requirements of chapter E 480 (storage batteries).

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.08 Guarding live parts in battery rooms. (1) **GUARDING.** The arrangement of cells and connections shall be such that any 2 current-carrying parts between which a voltage exceeding 150 volts exists shall be properly guarded if the parts are otherwise so exposed that persons are liable to make accidental contact with both at the same time.

(2) **BARE CONDUCTORS.** No bare conductor of more than 150 volts to ground shall be placed in any passageway, unless guarded or isolated by elevation.

(3) **DETAILS OF GUARDS.** Required guards shall comply with section E 112.05.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.

E 114.09 Illumination for battery rooms enclosing batteries of the nonsealed type. (1) **TYPE OF LAMP.** Storage-battery rooms, in addition to daylight which is desirable when available, should be lighted only by incandescent electric lamps in keyless porcelain or composition sockets, controlled from outside the battery room if practicable.

Note: It is recommended that portable lamps be used only in keyless sockets enclosed in holders provided with substantial guards to prevent lamp breakage and be provided with "hard-service" cord.

(2) **HEATING APPLIANCES.** Heating appliances with open flames or exposed incandescent resistors shall not be installed.

History: Cr. Register, November, 1961, No. 71, eff. 12-1-61.