

GENERAL INFORMATION ON SEALED LEAD-ACID BATTERIES

Construction and electrolyte

• Positive plates

Positive plates are plate electrodes of which a grid frame of lead-tin-calcium alloy holds porous lead dioxide as the active material.

• Negative plates

Negative plates are plate electrodes of which a grid frame of lead-tin-calcium alloy holds spongy lead as the active material.

• Electrolyte

Diluted sulfuric acid is used as the medium for conducting ions in the electrochemical reaction in the battery.

• Separators

Separators, which retain electrolyte and prevent shorting between positive and negative plates, adopt a non-woven fabric of fine glass fibers which is chemically stable in the diluted sulfuric acid electrolyte. Being highly porous, separators retain electrolyte for the reaction of active materials in the plates.

• Valve(One way valve)

The valve is comprised of a one-way valve made of material such as neoprene. When gas is generated in the battery under extreme overcharge condition due to erroneous charging, charger malfunctions of other abnormalities, the vent valve opens to release excessive pressure in the battery and maintain the gas pressure within specific range (0.07 to 0.43 kPa, or 1 to 6 ps)

During ordinary use of the battery, the vent valve is closed to shut out outside air and prevent oxygen in the air from reacting with the active material in the negative electrodes.

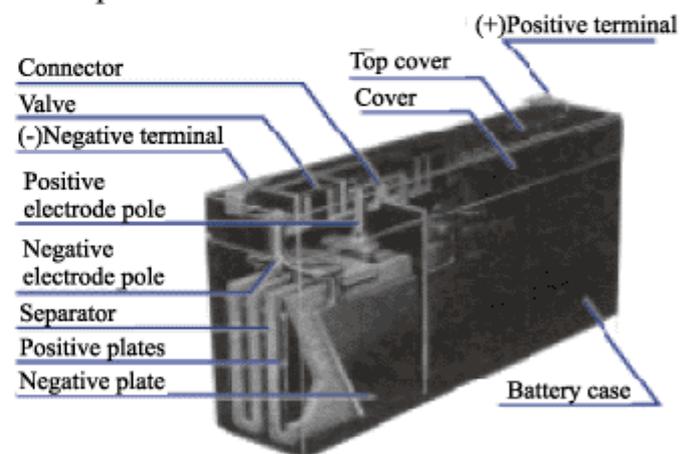
• Positive and negative electrode terminals

Positive and negative electrode terminals may be fasten tab type, bolt fastening type, threaded post type, or lead wire type, depending on the type of the battery. Sealing of the terminal is achieved by a structure which secures long adhesive-embedded paths and by the adoption of strong epoxy adhesives.

• Battery case materials

Material of the body and cover of the battery case are ABS resins, unless otherwise specified.

Example of construction



Electrochemical reactions on electrodes

The electrochemical reaction processes of the sealed lead-acid battery (negative electrode recombination type) are described below.

Where "charge" is the operation of supplying the rechargeable battery with direct current from an external

Power source to change the active material in the negative plates chemically, and hence to store in the battery electric energy in the form of chemical energy. "Discharge" is the operation of drawing out electric energy from the battery to operate external equipment.

