

Information Leaflet

Cleaning of Batteries

This information leaflet is a supplement to the operating instructions for stationary batteries and for vehicle traction batteries.)

A clean battery is an absolute necessity, not only because of the outward appearance but rather in order to avoid accidents and damage as well as a reduction in the life-time and the available operating time of the batteries. It is necessary to clean battery crates, trays, stands and insulators in order to maintain the required insulation of the cells against each other, against the earth(ground) or external conductive parts. Furthermore, cleaning avoids damage by corrosion or leakage currents.

The insulation resistance of traction batteries in accordance with DIN EN 50272-3 must be a minimum of 50 Ω per each volt nominal voltage. The insulation resistance in batteries for electrical industrial trucks in accordance with DIN EN 1175-1 must be a minimum of 1000 Ω .

With regard to stationary batteries in operation, a battery insulation resistance of at least 100 Ω per each volt nominal voltage is required in accordance with DIN EN 50272-2.

The battery is an electrical appliance with feedthroughs which are protected against accidental contact by insulating covers.

However, this is not to be equated with an electrical insulation, as there is a voltage between the terminals and the leads, which are fed through an electrically non-conductive plastic lid. Depending on the operating time and place, it is inevitable that dust may settle on the battery. Small amounts of electrolyte particles which escape from the battery during charging above the gassing voltage form a more or less conductive layer on the cells or on the monobloc lids. So-called leakage currents flow through this layer. As a result, increased and varying self-discharge occurs in the individual cells or monobloc batteries.

This is one of the reasons why drivers of electrical vehicles complain of a lack of capacity after the battery has been standing over the weekend.

If there is a flow of higher leakage currents, electrical sparking may occur, which may cause an explosion of the charging gas (detonating gas), which is released from the cell plugs or valves.

Therefore, the cleaning of batteries is necessary not only to ensure a good available operating time; it also forms an essential part in observing the rules for the prevention of accidents.

General safety instructions for cleaning batteries

- Observe the safety advice in the respective operating instructions for stationary batteries either for vehicle traction batteries.
- Use protective eyewear and protective clothing.

To prevent a build-up of static electricity when handling batteries, clothing/materials, safety boots and gloves are required to have a

– surface resistance of $\leq 10^8 \Omega$.

- Do not use dry cleaning cloths for cleaning!

Cleaning of stationary batteries

- The cell plugs must not be removed or opened. They must keep the cells closed. Observe the manufacturer's cleaning instructions.
- Plastic parts of the battery, in particular the cell containers, must only be cleaned with water and/or with wet cleaning cloths without any cleaning agents.
- After cleaning, dry the battery surface with appropriate means, e.g. with compressed air or with damp antistatic-cleaning cloths (e. g. cotton).

Cleaning of vehicle traction batteries

- Prior to cleaning, remove the battery from the vehicle.
- The place for cleaning must be chosen in such a way that the rinsing water containing electrolyte will flow into a facility suitable for the treatment of waste water. When disposing of used electrolyte and/or rinsing water, observe the regulations on health and safety at work and on accident prevention, as well as the regulations concerning water and waste disposal.

- The cell plugs must not be removed or opened. They must keep the cells closed. Observe the manufacturer's cleaning instructions.
- Plastic parts of the battery, in particular the cell containers, must only be cleaned with water and/or wet cleaning cloths without any cleaning agents.
- After cleaning, dry the battery surface with appropriate means, e. g. with compressed air or with damp antistatic cleaning cloths (e. g. cotton).
- Any liquid that is spilled into the battery tray must be removed by suction and disposed of in accordance with the aforementioned regulations. (For details refer to DIN EN 50272-3, and the ZVEI Information Leaflet „Safety measures for the handling of electrolyte for lead-acid batteries“.)

Vehicle traction batteries may also be cleaned with high pressure cleaning equipment. Also observe the operating instructions for the high-pressure cleaning appliance.

In order to avoid damage, during cleaning, to the plastic parts, such as lids, the insulation of the intercell connectors, and the plugs, observe the following points:

- The intercell-connectors must be securely screwed down or pushed in tightly.
- The plugs must be in place and closed.
- Cleaning agents must not be used.

- The maximum permissible temperature setting for the cleaning appliance is: 140 °C. This is to ensure that 30 cm behind the jet nozzle, the temperature does not exceed 60 °C.
- The distance between the jet nozzle of the high pressure cleaning appliance and the battery surface must be no less than 30 cm.
- The maximum working pressure is 50 bar.
- Clean large surface areas of the battery at a time, in order to avoid localised overheating.
- Do not leave the jet on one spot for any longer than 3 seconds.
- After cleaning, dry the battery surface with appropriate means, e. g. with compressed air or with damp antistatic cleaning cloths (e. g. cotton).
- Do not use air heaters with an open flame or with glow wires.
- The surface temperature of the battery must not exceed 60 °C.
- Any liquid that is spilled into the battery tray, must be removed by suction and disposed of in accordance with the aforementioned regulations. (For details refer to DIN EN 50272-3, and the ZVEI Information Leaflet „Safety measures for the handling of electrolyte for lead-acid batteries“.)