



Technical Note

SKC Sample Pump Nickel-Metal Hydride and Nickel-Cadmium Battery Pack Characteristics and Maintenance

Several SKC sample pumps use rechargeable battery packs that contain nickel-metal hydride (NiMH) or nickel-cadmium (NiCad) cells. Each battery chemistry has unique features and requirements. Batteries are perishable products that begin to age upon manufacture. Battery cycle life is not only predicated on the chemical makeup of the cells, but also on conditions of use such as temperature and pattern. Following recommended use, maintenance, and storage procedures will maximize each chemistry's advantages, minimize the disadvantages, and provide for optimal battery performance and cycle life.

For lithium-ion battery pack maintenance, see SKC Publication 1918.

Battery Overview

Chemistry	Cycle Life (approx.)	Environmental Impact	Energy Density
NiMH	300 to 500	Low	Moderate
NiCad	400 to 600	High	Moderate

NiMH Batteries for SKC Sample Pumps

SKC Universal XR, AirChek® 2000, and AirChek 52 personal sample pumps feature an NiMH battery pack, which provides longer run times.

NiMH Characteristics:

- Good energy density
- Less prone to memory than NiCad
- Environmentally friendly
- Discharge rate of 10 to 15% in first 24 hours after charging (compared to 10%/month for NiCad).
Charge battery before use for maximum run time

NiMH Maintenance:

- Charge battery completely upon receipt.
- Exercise a new battery for several cycles to reach stated capacity.
- Charge battery before use for maximum run time.
- Perform discharge and charge "exercising" once every 3 or 4 months to maintain optimum performance. To fully discharge battery, run until battery status icon on pump displays low battery fault. Achieve full discharge faster by running pump with sampling media attached.
- If storing the battery, store in a discharged state. Restore a completely discharged battery by exercising it 3 to 5 cycles.
- Ideal storage temperature is 70 F (21 C); higher temperatures increase the rate of self discharge

NiCad Batteries for SKC Sample Pumps

SKC Universal XR, AirChek 2000, and AirChek 52 pumps may be used with a NiCad battery but are supplied with an NiMH battery.

NiCad Characteristics:

- Stable energy density
- Long-storage battery that withstands deep discharge and offers economy
- Longer cycle life with proper maintenance
- Sensitive to charging temperature - ideally charge at room temperature
- Repetitive use to the same charge level can establish a false bottom/memory

NiCad Maintenance:

- Charge battery completely upon receipt.
- Exercise a new battery for several cycles to reach stated capacity.
- Ideally charge battery at room temperature.
- Erase false bottom/memory with a complete discharge and charge cycle.
- Perform discharge and charge “exercising” once every 3 or 4 months to maintain optimum performance. To fully discharge battery, run until battery status icon on pump displays low battery fault. Achieve full discharge faster by running pump with sampling media attached.
- If storing battery, store in a discharged state. Cycle a completely discharged battery 3 to 5 charge/discharge cycles to bring it to stated capacity.
- Ideal storage temperature is 70 F (21 C); higher temperatures increase the rate of self discharge

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