



# Technical Note

## SKC Sample Pump Battery Pack Characteristics and Maintenance

SKC sample pumps use rechargeable battery packs that contain NiCad, NiMH, or Li-Ion 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 of use. 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.

### Battery Overview

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

### Nickel-Metal Hydride (NiMH) Batteries for SKC Sample Pumps

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

#### NiMH Characteristics:

- Good energy density
- Does not develop false bottom/memory
- Environmentally friendly
- Discharge rate of 5 to 7% in first 24 hours (compared to 10%/month for NiCad) - charge battery before use for maximum run time

#### NiMH Maintenance:

- Charge battery completely upon receipt.
- Charge battery before use for maximum run time.
- Exercise a new battery several cycles to reach stated capacity.
- 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

## Lithium-ion (Li-Ion) Batteries for SKC Sample Pumps

Li-Ion batteries are used in SKC AirChek XR5000, Leland Legacy®, and QuickTake® 30 pumps. These batteries allow more powerful pumps to perform for longer run times.

### Li-Ion Characteristics:

- High energy density
- Low discharge rate
- Lower weight, higher voltage
- Shorter shelf-life
- Temperature sensitive - do not short-circuit or destroy/dispose by fire
- May be subject to special shipping regulations

### Li-Ion Maintenance:

- Charge battery completely upon receipt.
- Charge before use.\*
- Charge every 2 months if in storage
- Ideal storage temperature is 70 F (21 C); higher temperatures increase the rate of self discharge

\* AirChek XR5000 battery packs contain protective circuitry to meet intrinsic safety requirements. This additional circuitry discharges the battery pack within 10 to 30 days of charging. For optimum performance, always charge battery packs before use.

### Li-Ion Battery Shipment

Rechargeable lithium-ion batteries for use with SKC sample pumps have been tested in accordance with the UN Manual and are proven to meet requirements of each test in the *UN Manual of Test Criteria*, Part III, subsection 38.3. They have a watt-hour (Wh) rating below 100. Battery packs tested include: P85002, P85004, P75689, and P75692.

**Per 2013 IATA regulations for air shipments**, packaging must meet the specifications of and contain labeling and documentation required by IATA Packing Instructions 967 (UN 3481, Section II), 966 (UN 3481, Section II), and 965 (UN 3480, Sections IA >10 Kg G and IB 2.5 to 10 Kg G). *See IATA Lithium Battery Guidance Document: Transport of Lithium Metal and Lithium Ion Batteries, Revised for the 2013 Regulations*

## Nickel-Cadmium (NiCad) Batteries for SKC Sample Pumps

The SKC 222 personal sample pump utilizes a NiCad battery. Pocket Pump, 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
- 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.
- Ideally charge battery at room temperature.
- Exercise a new battery several cycles to reach stated capacity.
- 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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