BATTERY MAINTENANCE

For Portable Devices

These recommendations have been developed to keep workers safe and protect your investment by drawing on Honeywell's experience in industrial applications and testing.

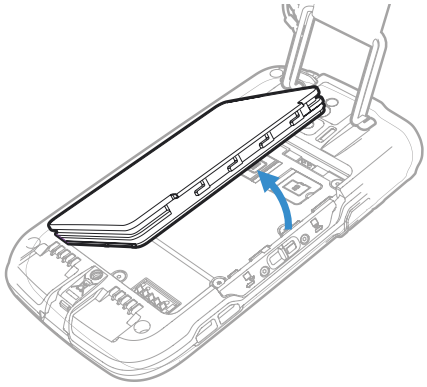
Honeywell supplies lithium ion (Li-ion) batteries for many mobile devices, including handheld, wearable, and vehicle-mounted computers. Li-ion batteries feature several advantages – such as high energy density, quick charge, low rate of self-discharge, and low operating temperatures – that prove ideal for portable devices.

Proper maintenance helps avoid damage to the battery and device, and it promotes a longer useful life between battery replacements. This document provides guidelines for a) normal daily usage, b) storage, and c) disposal of batteries.

It is important to note that battery specifications and installation/replacement methods differ among devices. Before proceeding, review your batteries' markings and product inserts and the devices' user guides for all applicable instructions, temperatures ranges, electrical characteristics and cautions.

GENUINE HONEYWELL PRODUCTS

Use only batteries, accessories, chargers and power adapters manufactured (or, when specified, authorized) by Honeywell, in order to comply with the original warranty terms. Do not charge other vendors' batteries or devices in Honeywell equipment.



Sample battery removal, from CT60 mobile computer.

KEY TERMS

Device – mobile computer, scanner, printer, or other battery-operated equipment

Battery – rechargeable Li-ion dc power source

Charger – power source provided for charging specific battery or device

Base *(Adapter or Dock)* – a cradle or a cord that provides power to the device

IMPORTANT SAFETY REMINDERS

Keep children away from batteries.

If battery liquid gets into eyes, do not rub eyes. Wash with clean water and seek medical attention.

If battery leaks on skin or clothes, wash with fresh water.

If fire, overheating, or odors are observed during charging, leave immediately and notify safety personnel.

Do not charge or store batteries near flammable, combustible, or metal materials.

Never throw, drop, or crush a battery or device; fire or chemical burn hazard may result.

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INITIAL BATTERY CHARGE

Each battery ships with only a partial charge; fully charge before use. Allow batteries to reach ambient temperature before charging, and do not charge them in direct sunlight. Always charge batteries in a ventilated area within the safe temperature storage rating.

You can verify the battery's charge status most reliably according to the device's display.

A: NORMAL BATTERY USAGE

Li-ion batteries typically last for 300 to 500 full charge cycles at room temperature. Battery lifetime may be limited by the requirements of the device that it powers, the operating and storage environments, the level of charge during storage, age, and other factors.

Throughout its life, a battery tends to hold and retain less of a charge, as it is exposed to the stresses of each charge-discharge cycle. A depleted battery reduces the time between charges and has the potential to reduce the performance of the device.

Batteries should be replaced periodically, typically every two years depending on the specific device. Immediately discard and replace any battery with the following symptoms (see "C. Battery Disposal," below):

- The device's "Battery State of Health" indicator falls below 70%.
- The operator reports a significant reduction in the device's performance or runtime, which is solvable by a replacement battery.
- The battery is noticeably deformed, swollen, or discolored.
- The battery is too hot to handle (a surface above 60 °C [140 °F]).
- The battery has been in service for longer than two years.

A "low" battery (< 30% capacity) should be recharged as soon as possible. For improved battery life, avoid allowing a battery to discharge below 10% capacity.

Batteries are designed to be inserted with minimal effort, so you will never need to force a battery into the device. Refer to the device's user guide for instructions for inserting or swapping a battery. Likewise, do not attempt to remove the battery from the device with a tool.

Unless the device supports "swap battery" capability, power down the device before replacing the battery.

The bulk of normal battery maintenance involves monitoring capacity and recharging. On occasion, you may need to remove dirt from a battery or the terminals. Simply wipe them with a clean, dry cloth.

ADDITIONAL USAGE PRECAUTIONS

All personnel who handle batteries and devices should also be trained in the following guidelines:

- Do not stack anything on top of batteries.
- In all cases, be extremely careful not to short-circuit a battery's terminals. A short may result, for example, when battery terminals touch each other, they are placed next to conductive (metal) media, or batteries are placed in a pocket with coins or office supplies.
- Do not immerse batteries into, or expose them to, water or seawater.
- Do not incinerate, microwave, throw into a fire, or expose batteries to temperatures above the documented maximum rating.
- Do not disassemble a battery or try to open or penetrate its housing.

B: BATTERY STORAGE

When not in use, keep batteries in a dry environment (<70% RH, non-condensing) within documented temperature storage ranges. Do not leave batteries in any location warmer than the documented maximum storage temperature, or store them in direct sunlight.

Do not store batteries that are completely depleted. The recommended charge for long-term storage is 30% to 50% of capacity.

Expect batteries to self-discharge slowly over time, even when they are not attached to a device. Note that higher storage temperatures result in higher self-discharge rates, which means that those batteries will require more frequent charging.

Periodically check stored batteries for their charge state. Recharge as needed.

If you are storing the device for a few days (such as over the weekend), install a fully charged battery or connect the device to a charger or base. If you are storing the device for a longer period of time (such as a week or more), fully charge the battery. Then, remove the charged battery from the charger or device, and store it separately in a cool location.

Stored batteries should be separated, not touching any other battery, device, charger, or accessory.

C: BATTERY DISPOSAL

Using tape, insulate the terminals of all obsolete, discontinued, damaged, and malfunctioning batteries and place in a clearly marked receptacle. Dispose of them as soon as possible, or within your routine maintenance schedule.

Dispose of used batteries according to any applicable regional or national hazardous materials regulations. Where available or required, recycle all Li-ion batteries.

Handle damaged batteries or leaked contents with extreme care. (Refer to “Important Safety Reminders,” above.)

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