

# Replacement, Recycling and Disposal of Batteries in IBM/Lenovo Products

## ***Introduction***

Many Information Technology (IT) products manufactured today use some kind of battery. Typical battery applications include:

- Powering memory devices to save critical system settings while equipment is turned off
- Powering portable devices such as notebook and hand held computers when disconnected from a power source.
- Uninterruptible power supplies designed to allow for safe shutdown of equipment during a power outage.

The most common battery type used in today's electronic products are Lithium "cell" batteries. These small coin-shaped batteries are typically used to power memory circuits when systems are shutdown, saving critical configuration settings and speeding startup when systems are powered on. These batteries are not rechargeable. However, they are generally designed to last several years without need for replacement.

Batteries used to power portable products such as IBM/Lenovo ThinkPad mobile computers are typically larger, and are designed to be recharged and reused many times. These batteries are generally contained in a plastic case or "pack" along with some additional components designed to allow for safe recharging of the battery. Many older portable products used Nickel Cadmium (Ni-Cd) battery packs. However, over the past several years, battery technologies used in portable products have improved, increasing battery life and reducing "memory" effects which led to premature failure of batteries. Most IBM/Lenovo portable products introduced since 1995 use either Nickel Metal Hydride (Ni-MH) batteries or Lithium Ion (Li-Ion) batteries. All current IBM/Lenovo ThinkPad models use Lithium Ion battery packs to power systems when disconnected from a main power source.

Uninterruptible power supplies typically use Sealed Lead Acid (Pb) batteries. Sealed lead acid batteries provide high current and power for short periods of time to allow for safe shutdown of systems during a power outage. Sealed lead acid batteries are rechargeable and designed for several years of normal use.

## ***Removal of Batteries from IBM/Lenovo Products***

Customers should consult their product operating manual for information concerning safe removal and replacement of batteries in IBM/Lenovo products. Some batteries, such as the battery packs used to power portable products, are designed for easy removal and replacement by customers. Other batteries should only be removed and replaced by authorized service providers.

## ***Disposal of Used Batteries***

Regulations and requirements for disposal of used batteries vary by country, state, and/or municipality. Additionally, requirements may vary depending on battery type.

For example, several US States, including Florida, Maryland, Minnesota, and New Jersey restrict disposal of rechargeable nickel cadmium and sealed lead acid batteries in municipal wastes. Additionally, some municipalities may also restrict disposal of Nickel Metal Hydride batteries.

Discharged Lithium and Lithium Ion batteries are currently designated to be disposed of in normal trash. However, users should contact their municipal waste disposal facility prior to discarding any used battery in normal trash.

## ***Identification of Battery Type***

All batteries and battery packs contained in current IBM products are marked to indicate the battery's chemistry. The following abbreviations may be used to identify the battery's Chemistry.

<b>Battery Type</b>	<b>Symbol/Abbreviation</b>
Lithium Ion Battery	Li-Ion
Lithium Battery	Li
Nickel Metal Hydride Battery	Ni-MH or NiMH
Nickel Cadmium Battery	Ni-Cd
Lead Acid Battery	Pb
Integrated Battery Feature (IBF) type Lead Acid Battery assemblies	Pb