

Replacement, Recycling and Disposal of Batteries in IBM 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 "button 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 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 "battery 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 portable products introduced since 1995 use either Nickel Metal Hydride (Ni-MH) batteries or Lithium Ion (Li-Ion) batteries. All current IBM 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 Products

Customers should consult their product operating manual for information concerning safe removal and replacement of batteries in IBM 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.

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. In the United States, IBM has established a recycling process for these battery types, as well as for Lithium batteries, Lithium Ion batteries and battery packs.

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. Alternatively, IBM recommends users may return Lithium, Lithium Ion and Lithium Ion battery packs to IBM for recycling.

Please see Appendix A for instructions on return of used Nickel Cadmium, Nickel Metal Hydride, Sealed Lead Acid, Lithium, or Lithium Ion Batteries to IBM for recycling or proper disposal. Refer to Appendix B for Integrated Battery Feature (IBF) type sealed Lead acid battery assemblies and proper disposal procedures by authorized service providers.

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.

Battery Type	Symbol / Abbreviation
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

Appendix A

IBM US Return Process for Used Nickel Metal Hydride, Nickel Cadmium, Sealed Lead Acid, Lithium and Lithium Ion Batteries

In the United States, IBM has established a process whereby IBM customers may return used Nickel Metal Hydride, Nickel Cadmium, Sealed Lead Acid, Lithium and Lithium Ion batteries to IBM for proper disposal or recycling. Only batteries from IBM products may be returned through this process.

Batteries or battery packs must show no signs of leakage or corrosion. To prevent short circuiting and heat buildup during storage and transport, use tape to cover the metal (+/-) terminals on any battery that is not individually wrapped or included in a battery pack. Customers should not attempt to disassemble battery packs or assemblies prior to return.

IBM customers are responsible for complying with all federal, state, and local laws and regulations related to the packing, labeling, and shipping of batteries, and all packages must include a complete return address on the outside of the package. Batteries should be shipped prepaid, using a surface mode of transportation. **Under no circumstances should used/recyclable/returnable batteries be shipped by air.**

Failure to comply with the above requirements may result in the rejection and return of the package at shippers expense.

**Ship to: IBM Corporation
Battery Return Program Dept. 713
3605 Hwy. 52N
Rochester, MN 55901-9907**

Appendix B

IBM US Return Process for Used Integrated Battery Feature (IBF) type Lead Acid Battery Assemblies

In the United States, IBM has established a process whereby IBM customers may returned used Nickel Metal Hydride, Nickel Cadmium, Sealed Lead Acid, Lithium and Lithium Ion batteries to IBM for proper disposal or recycling. Only batteries from IBM products may be returned through this process.

Integrated Battery Feature (IBF) type sealed Lead (Pb) Acid battery assemblies are to be handled only by IBM contract service representatives or other authorized personnel. These assemblies are heavy and contain many sealed Pb Acid batteries connected together. A circuit breaker (on/off switch) is evident on the assembly. These assemblies require proper procedures, packaging instructions and packaging containers, which are specified in the individual product documentation. The following table provides examples of IBF type assemblies used in some of IBM's mid to large server products.

IBF Assemblies	Battery Chemistry	Battery Part Numbers	IBM Packing Container Part Number	IBM Packing Instructions Part Number
IBF-360-2.3	Sealed Pb Acid	44H2790	7335163	7334983
IBF-360-2.5	Sealed Pb Acid	11P3732	7335885	Not Applicable
IBM-360-0.8	Sealed Pb Acid	44H2792	7335218	7335226

Customers should not attempt to disassemble these units prior to return, but contact the appropriate trained personnel.

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Failure to comply with the above requirements may result in the rejection and return of the package at shippers expense.

Ship to: IBM Corporation

**522 South Road
Building 004-1, RMER Area
Poughkeepsie, NY 12602**