



Coin Cell Batteries Used in HP Products

PURPOSE OF THIS DOCUMENT

Hewlett-Packard Company (HP) is providing the information in this document voluntarily as a service to its customers. The products addressed in this document are generally defined as “articles” that are exempt from requirements for Material Safety Data Sheets (MSDS) such as under the Hazard Communication Standard of the U.S. Occupational Safety and Health Administration (OSHA), 29 CFR 1910.1200, European Union Regulation (EC) 1907/2006, and similar requirements in other countries. In particular, these products are manufactured according to a specific design, have an end-use dependent upon such design, are not intended to release chemicals during normal use or handling, and do not normally release more than trace amounts of hazardous chemicals.

The information in this document is based on documents provided by the battery manufacturers, and is intended to provide a generalized, composite view of the information in such documents for the convenience of HP’s customers. The information in this document is not intended to be comprehensive, nor is it a substitute for the information provided by the manufacturers of the coin cell batteries in their Product Information Sheets or similar documents. To the extent that the manufacturer’s information differs from any information in this document, the manufacturer’s information should govern.

PRODUCT IDENTIFICATION

The products covered by this document are Coin Cell Batteries (also known as Button Cell Batteries) originally contained in HP-branded electronic products or otherwise provided by HP for use in or with such electronic products. They can be characterized by a cylindrical metal case 12 to 35 mm in diameter and less than 6 mm thick. They may be single use or rechargeable and operate at 1.2 to 3.6 V with capacities varying from 45 to 700 mAh. The physical dimensions and basic chemistries of these batteries are standardized across the industry.

The specific models typically utilized in HP products are specified below. In most cases, the batteries are installed in electronic equipment and not shipped separately. However, this document is focused only on the batteries.

Table 1: Button cell battery models used in real-time clock and non-volatile memory applications in HP Products

| Model Number | Chemistry | Li Content (grams) | Battery Weight (grams) | Diameter (mm) | Height (mm) | Capacity (mAh) | Voltage (V) |
|---------------------------------------------|-------------------------------------------------|--------------------|------------------------|---------------|-------------|----------------|-------------|
| Non-Rechargeable Coin Cell Batteries | | | | | | | |
| BR1225 | (Li-CF) Lithium Carbon monofluoride | 0.01 | 0.8 | 12.5 | 2.5 | 48.0 | 3.0 |
| BR1632 | (Li-CF) Lithium Carbon monofluoride | 0.04 | 1.5 | 16.0 | 3.2 | 120.0 | 3.0 |
| BR2032 | (Li-CF) Lithium Carbon monofluoride | 0.06 | 2.5 | 20.0 | 3.2 | 190.0 | 3.0 |
| BR2330 | (Li-CF) Lithium Carbon monofluoride | 0.08 | 3.2 | 23.0 | 3.0 | 255.0 | 3.0 |
| CR2016 | (LiMnO ₂) Lithium Manganese Dioxide | 0.03 | 1.7 | 20.0 | 1.6 | 90.0 | 3.0 |

| Model Number | Chemistry | Li Content (grams) | Battery Weight (grams) | Diameter (mm) | Height (mm) | Capacity (mAh) | Voltage (V) |
|--------------|--------------------------------------------------|--------------------|------------------------|---------------|-------------|----------------|-------------|
| CR2025 | (LiMnO ₂) Lithium Manganese Dioxide | 0.05 | 2.5 | 20.0 | 2.5 | 165.0 | 3.0 |
| CR2032 | (LiMnO ₂) Lithium Manganese Dioxide | 0.07 | 3.0 | 20.0 | 3.2 | 225.0 | 3.0 |
| CR2450 | (LiMnO ₂) Lithium Manganese Dioxide | 0.19 | 5.9 | 24.5 | 5.0 | 620.0 | 3.0 |
| ER22G68 | (Li-SOCl ₂) Lithium Thionyl Chloride | 0.12 | 6.0 | 22.6 | 7.5 | 400 | 3.6 |
| ER22G75 | (Li-SOCl ₂) Lithium Thionyl Chloride | 0.12 | 5.7 | 22.8 | 11.7 | 400 | 3.6 |
| LR44 | Alkaline | 0.0 | 2.0 | 11.6 | 5.4 | 120 | 3.0 |

Rechargeable Coin Cell Batteries

| | | | | | | | |
|---------|-------------------------------------------------|------|------|------|-----|-----|-----|
| ML1220 | (LiMnO ₂) Lithium Manganese Dioxide | 0.01 | 0.8 | 12.5 | 2.0 | 170 | 3.0 |
| V500HRT | (Ni-MH) Nickel Metal Hydride | 0.0 | 14.0 | 34.0 | 6.9 | 0.5 | 1.2 |
| V650HRT | (Ni-MH) Nickel Metal Hydride | 0.0 | 15.0 | 34.0 | 6.9 | 0.7 | 1.2 |

NOTE: HP does not use coin cell batteries containing Mercury (M or N Series), Silver Oxide (SR series), or Ni-Cd chemistries in new products.

SAFETY PRECAUTIONS

CAUTION: Vapor, generated from burning batteries may make eyes, nose and throat irritated. In case of fire, use CO₂ or dry chemical extinguishers. Wear respiratory protection equipment in some cases.

These batteries contain organic electrolytes. Under normal condition of use, the chemicals are contained in sealed assemblies. Risk of exposure may occur if the battery is physically abused. The organic electrolytes in the cell can cause respiratory, skin and/or eye irritation. In the event physical damage results in the leakage of chemical contents, individuals coming in contact with those chemicals should follow these steps:

- **Eye contact:** DO NOT RUB EYES. Immediately flush the eyes with plenty of clean water for at least 15 minutes. Seek medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.
- **Skin contact:** Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
- **Inhalation:** Move to fresh air immediately. Seek medical evaluation and/or treatment.
- **Swallowing: COIN CELL SAFETY NOTICE:** Keep coin cell batteries out of the reach of small children in that coin cell batteries can be accidentally ingested. If ingested, these batteries may leak harmful contents causing chemical burns, perforation of soft tissue, and in severe cases may cause death. Lithium coin batteries must be removed immediately if swallowed. Seek medical attention immediately.

DISPOSAL

Do not incinerate. Spent coin cell batteries should be disposed of or recycled in accordance with any applicable national, state/provincial, and local requirements. HP encourages the environmentally sound recycling of these batteries. HP has joined the Call2Recycle™ recycling program of the Rechargeable Battery Recycling Corporation. In the U.S. and Canada, please call

1-800-8-BATTERY or go to www.rbrc.org for information on recycling your used rechargeable batteries.

TRANSPORTATION

The requirements applicable to transport of coin cell batteries vary depending upon their chemistry and other factors. The key categories of coin cell batteries are discussed separately below.

Lithium Metal Coin Cell Batteries

This category includes Lithium Carbon Monofluoride (Li-CF) Batteries (BR Series), Lithium Manganese Dioxide (LiMnO₂) Batteries (CR Series), Lithium Thionyl Chloride (Li-SOCl₂) Batteries (ER Series), and Lithium Aluminum Manganese Dioxide (Li/Al-MnO₂) Batteries (ML Series) Batteries.

Lithium metal batteries are generally classified for purposes of transportation as either UN 3090 (Lithium Metal Batteries) or UN 3091 (Lithium Metal Batteries Contained In or Packed with Equipment). However, the lithium metal batteries originally contained in HP-branded electronic products (or otherwise provided by HP for use in or with such electronic products) are generally of a type that allows the batteries to be excepted from requirements for transport as Class 9 hazardous materials or dangerous goods under most national and international regulations. The batteries contain no more than 1 g of lithium per cell or no more than 2 g of lithium per battery. In addition, the batteries are of a type that has been demonstrated to pass each applicable test (T.1 through T.8) under the UN Manual of Tests and Criteria (ST/SG/AC.10/11/Rev.4), Part III, Subsection 38.3.

To qualify for exception, the batteries may be subject to certain requirements relating to packaging, marking, shipping documentation, quantity limitations, and the like. For example, under the Dangerous Goods Regulations (55th Edition, 2014) of the International Air Transport Association ("IATA"), excepted lithium-ion batteries must be transported in accordance with the requirements of Section II of Packing Instruction 965. See also, e.g., Special Provision 188 of the International Maritime Dangerous Goods ("IMDG") Code (2012 Edition); 49 C.F.R. § 173.185(c); Special Provision 34 of the Canadian Transport of Dangerous Goods Regulations.

To qualify for exemption from Class 9 hazardous materials or dangerous goods transport requirements, certain conditions must be met, such as Packing Instructions 965, 966, and 967 of the International Air Transport Association (IATA) Dangerous Goods Regulations, and Special Provision 188 of the International Maritime Dangerous Goods (IMDG) Code.

ICAO/IATA – Effective January 1, 2013 these BR cells can be shipped by air in accordance with International Air Transport Association (IATA) 54th edition, Section II, since these cells have less than 0.3 g of Lithium per cell. See Packing Instructions: PI 968 (Batteries), PI 969 (Batteries, packed with equipment) and PI 970 (Batteries, contained in equipment) as applicable.

Cells and batteries are to be separated so as to prevent short circuits and packed in strong packaging, except when installed in equipment. When installed in equipment, each package containing more than 24 cells or 12 batteries must be marked indicating that it contains lithium batteries and that special procedures should be following in the event that the packaging is damaged. In addition, each shipment must be accompanied by appropriate documentation and the package must be capable of withstanding the drop test requirements.

Shipping packages containing non-rechargeable lithium batteries must be labeled, regardless of size or number of batteries, with the following statement: "PRIMARY LITHIUM BATTERIES – FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT." The labeling requirement covers shipments via highway, rail, vessel or cargo-only aircraft and covers all shipments inside, into or out of the US. The label must be in contrasting color and the letters must be 12 mm (0.5 in) in

height for packages weighing more than 30 kg (66 lbs.) and 6 mm (0.24 in) in height for packages less than 30 kg (66 lbs.).

Effective January 1, 2009, new ICAO regulations for air cargo shipments require a reduced package size quantity and the use of two new labels for batteries that are not installed in equipment. The maximum quantity a single master carton must not exceed 2.5 Kg. The new caution label requires the proper UN for the batteries being shipped and a telephone number for information. The package must also bear a 'cargo aircraft only' label. At this time, IMO and ADR continue to follow Special Provision 188 from the UN Model Regulations.

Dry Cell Batteries

This category includes Alkaline Batteries and Rechargeable Nickel Metal Hydride (NiMH) batteries (V Series) that are considered to be "dry cells" and are not regulated for the purposes of transportation by the International Air Transport Association (IATA).

FOR ADDITIONAL INFORMATION

Additional information, such as Product Information Sheets may be found on the battery cell manufacturer's web sites listed in the table below:

Table 2: Button cell battery manufacture links to additional information documents

| Coin Cell Manufacturer | MSDS / PDS Link |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Duracell | http://ww2.duracell.com/en-US/Global-Technical-Content-Library/Product-Data-Sheets.aspx?icn=Prim/PrimNav/Product-Data-Sheets&cc=Primary |
| Eve | http://www.evebatteryusa.com/products_lithiumprimary_lisoci2.htm |
| FDK (Fujitsu) | http://www.fdk.com/cyber-e/pi_bt_msds.html |
| Hitachi-Maxell | http://biz.maxell.com/en/product_index/?pci=9#4 |
| JHT (Jhih Hong /Long Trump) | http://www.jht-energy.com |
| KTS (Lixing / Vic Dawn) | http://www.shihno.com.tw |
| Mitsubishi | http://www.meau.com/eprise/main/sites/public/About_Us/Environment/Battery_Material_Data_Sheets |
| Panasonic (Matsushita) | http://na.industrial.panasonic.com/products/batteries |
| Renata | http://www.renata.com/industrial-products/3v-lithium-coin-cells |
| Shun Wo (Newsun) | http://www.newsun.com.hk/battery-category/primary-button-series-cr-30v?page=1&order=field_weight&sort=asc |
| Sony | http://www.sony.net/Products/MicroBattery/cr/spec.html |
| Tadiran | http://www.tadiranbatteries.de/eng/products/overview |
| Toshiba | http://www.toshiba-batteries-eu.com/battery/lithium-coin |
| Varta | http://www.varta-microbattery.com/en/products/batteries-cells-configurations/technology.html |

DISCLAIMER

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ISSUE DATE

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