

HP Product Information Sheet:

Lithium Metal (CR-Type) Non-Rechargeable Batteries for 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 viewed as "articles" that are exempt from requirements for Material Safety Data Sheets ("MSDSs") such as the Hazard Communication Standard of the U.S. Occupational Safety and Health Administration ("OSHA") 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, and do not normally release more than trace amounts of hazardous chemicals.

PRODUCT IDENTIFICATION

The products covered by this document are lithium metal (CR-type) non-rechargeable batteries originally contained in HP-branded electronic products or otherwise provided by HP for use in or with such electronic products.

Such batteries may be produced by a number of manufacturers. Information about individual battery types can be found in documents provided to HP by the manufacturers. HP has not conducted an independent assessment of the information in the documents.

The information in this document is based on the documents provided by the 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, and should not be used as, a substitute for the information provided by the manufacturers. To the extent that a manufacturer's information differs from any information in this document, the manufacturer's information should govern.

HAZARDS IDENTIFICATION

The battery contains combustible materials. Improper handling or use of the battery may lead to distortion, leakage, heat generation, or violent rupture. Direct contact between the battery contents and the skin or eyes may cause irritation or thermal burns. Inhalation of vapors generated from burning or leaking batteries may cause respiratory and eye irritation. Ingestion of a leaking battery may irritate the internal and external mouth areas. Leakage, caustic burns, and perforation may occur two or more hours after ingestion of the battery.

COMPOSITION

The composition of the lithium metal (CR-type) non-rechargeable batteries originally contained in HP-branded electronic products (or otherwise provided by HP for use in or with such products) may vary. The composition information below is intended to provide a generalized, composite view of the constituents of the relevant lithium metal batteries. For information on the composition of individual battery types, please see the information available from the individual battery manufacturers.

Chemical	CAS No.	Percent (Max.)
Manganese dioxide	1313-13-9	75
Propylene carbonate	108-32-7	15
Lithium	7439-93-2	10
Graphite	7440-44-0	10
1,2-dimethoxyethane	110-71-4	10
Teflon	116-14-3	4.5
Lithium perchlorate	7791-03-9	1.5
Nickel	7440-02-0	0.9
Polypropylene	9003-07-0	0.5

The constituents above are listed in one or more of the lithium metal (CR-type) non-rechargeable battery documents provided by the manufacturers, at concentrations up to the levels indicated in the last column of the table. One manufacturer document also lists "organic electrolyte" at concentrations of 12%, but this generic category is not included in the table above, because it may be intended to encompass some of the individual chemicals in the table (e.g., propylene carbonate and/or 1,2-dimethoxyethane). Some manufacturer documents also list inert metals (e.g., stainless steel, iron, aluminum, or copper), but these metals are not included in the table above because they are unlikely to be of regulatory concern, the concentrations are not known, and inclusion might significantly reduce the concentrations of the constituents specified in the table. Although these chemicals are the only ones identified in the documents from the manufacturers, HP believes that other compounds containing lithium and/or metals may be present, particularly in used batteries, due to chemical reactions that take place within the batteries, especially during use. For example, the primary overall reaction during use of a CR-type lithium metal battery is $MnO_2 + Li \Rightarrow MnOOLi$, so used batteries can be expected to contain some quantity of lithium manganese oxide. Finally, the information in the table is based on the composition of the lithium metal battery cells only, and does not reflect the constituents that may be present in any other parts of a battery pack.

FIRST AID MEASURES

Intact batteries do not represent a danger to health. If exposure to internal material occurs, the following first-aid actions are recommended:

In response to inhalation, provide fresh air and refer for medical attention.

In response to eye contact, wash with copious amounts of water for fifteen (15) to thirty (30) minutes, without rubbing. Contact a physician.

In response to skin contact, remove contaminated clothes and rinse skin with soap and water. If pain or irritation persists, refer for medical attention.

In response to ingestion, rinse the mouth and surrounding skin with water. Seek immediate medical attention.

FIRE FIGHTING MEASURES

In case of fire, it is permissible to use the following extinguishing media on lithium metal batteries or their packing material: dry chemical, dry sand, alcohol-resistant foam, and carbon dioxide. At the first sign of fire, move batteries away from the heat and cool exterior of batteries to prevent rupture. Fire fighters should wear self-contained breathing apparatus and full protective clothing.

ACCIDENTAL RELEASE MEASURES

Evacuate the area and allow for ventilation of the room. Clean-up personnel should wear appropriate protective clothing to avoid eye and skin contact and ensure respiratory protection. Use cloth, sand, or clay to absorb the liquid battery contents. Battery materials should be collected in an appropriate container for disposal. Keep battery away from fire.

HANDLING AND STORAGE

Advice on safe handling: Do not: reverse the positive and negative terminals of the battery when mounting; allow battery terminals to contact each other or other metals; short-circuit the battery; heat the battery; disassemble the battery; directly weld the terminal or wire to the body of the battery; solder directly onto the battery; or mix different types of batteries. Do not damage, crush, or incinerate the battery.

Advice on storage: Batteries should be stored in well-ventilated, dry, and cool conditions. For normal storage, temperatures should be between -20°C (-4°F) to 35°C (95°F). Do not expose the battery to water or direct sunlight. Packaging should be durable to ensure batteries are not damaged during transport.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protective equipment is not required for handling intact cells. In response to leaking batteries, use the following equipment: natural rubber or butyl rubber gloves, safety goggles, and a self-contained breathing apparatus.

PHYSICAL AND CHEMICAL PROPERTIES

Form	Solid
Color	Various
Odor	Odorless
pH	n/a
Flash point	n/a
Vapor pressure	n/a
Density	n/a
Water solubility	Insoluble
Ignition temperature	n/a

STABILITY AND REACTIVITY

Stability: Stable under normal handling and use. Thermal decomposition may produce hazardous fumes of lithium and manganese; oxides of carbon; and other toxic by-products. Hazardous polymerization will not occur. Even with proper storage, battery performance will deteriorate over time. Failure to maintain recommended storage conditions may shorten battery life expectancy.

Conditions to avoid: Keep away from fire and do not crush, short, heat, or disassemble batteries as rupture of the battery or leakage of contents may occur. Exposed lithium will react with water and produce flammable gas.

TOXICOLOGICAL INFORMATION

Routine handling and use of this product does not result in significant exposure to substances of toxicological concern. The battery cells contain toxic components, including manganese dioxide (LD50 oral rat > 2,000 mg/kg), propylene carbonate (LD50 oral rat 29,100 uL/kg), and 1,2-dimethoxyethane (LDLo oral rat 1,000 mg/kg).

ECOLOGICAL INFORMATION

To avoid improper exposure to environment, battery should be disposed of per the “Disposal Considerations” guidance below.

DISPOSAL CONSIDERATIONS

Dispose of batteries in accordance with any applicable federal, state/provincial, and local regulations. Contact between discarded batteries and other metals could lead to distortion, leakage, overheating, or violent rupture. To avoid these results, positive (+) and negative (-) terminals of the battery should be insulated prior to disposal.

HP encourages the environmentally sound recycling of these products. Contact your local government for recycling or collection practices in your area.

TRANSPORTATION

Lithium metal batteries are generally classified for purposes of transportation as UN 3090. 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. For example, the batteries have lithium content of no more than 1 g per cell or no more than 2 g per battery pack. 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 metal batteries must be transported in accordance with the requirements of Section II of Packing Instruction 968. 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.

Under IATA Special Provision A154 and Packing Instruction 968, recalled or damaged lithium batteries are generally prohibited from air transportation. In addition, under IATA Special Provision A183, waste batteries and batteries shipped for recycling or disposal are forbidden for air transport unless specially approved by appropriate national authorities. As of January 1, 2015, lithium metal batteries not contained in or packed with equipment will be prohibited by IATA for transport as cargo aboard passenger aircraft.

ISSUE DATE

This document was issued on November 2014.