HP Product Information Sheet:

Lithium-Ion Rechargeable Batteries for HP Products

PURPOSE OF THIS DOCUMENT

HP Inc. ("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-ion rechargeable batteries originally contained in HP-branded electronic products (*e.g.*, notebook computers, handheld devices, and printing devices) 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 by the manufacturers, which HP voluntarily makes available to the public at www.hp.com/go/ecodata. The manufacturers have assured HP that they believe these documents are reliable as of the dates indicated in the documents. 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

Under routine handling and use, no known effects on eyes, skin, or inhalation. In the battery cell(s), chemical materials are stored in a sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal handling and use. As a result, during normal handling and use, there is no significant physical danger of ignition, explosion, or exposure to materials of concern. However, if the battery is exposed to a fire, the battery may rupture violently, leading to the possible release of irritating gas.

COMPOSITION

The composition of the lithium-ion 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-ion batteries. For information on the composition of individual battery types, please see the information provided by the individual battery manufacturers, which as noted above can be found at www.hp.com/go/ecodata

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Chemical	Cas No.	Percent (Max.)
Graphite	7782-42-5	30
Lithium cobalt oxide	12190-79-3	50
Cobalt oxide	1307-96-6	50
Nickel oxide	1313-99-1	50
Manganese oxide	1313-13-9	50
Diethyl carbonate	105-58-8	15
Dimethyl carbonate	616-38-6	15
Ethyl methyl carbonate	623-53-0	15
Propylene carbonate	108-32-7	15
Ethylene carbonate	96-49-1	15
Polyvinylidine fluoride	24937-79-9	10
Hexafluoropropylene-vinylidene fluoride copolymer	9011-17-0	15
Lithium hexafluorophosphate	21324-40-3	5
Aluminum	7429-90-5	10
Copper	7440-50-8	15
Nickel	7440-02-0	15
Styrene butadiene rubber	9003-55-8	5
Iron	7439-89-6	25
Manganese	7439-96-5	15
Acetylene black (carbon black)	1333-86-4	2

The constituents above are listed in one or all of the lithium-ion battery documents provided by the manufacturers, at concentrations up to the levels indicated in the last column of the table. Some of the manufacturer documents also list “transition metal oxides” (at concentrations up to 50%) and/or “organic solvent”/“organic electrolyte” (at concentrations up to 20%) as battery constituents. These generic categories are not included in the table above, because they may be intended to encompass some of the individual chemicals in the table (e.g., “transition metal oxides” may refer to the oxides of cobalt, nickel, and/or manganese). Similarly, some manufacturer documents list “plastic” (at concentrations up to 4%), but this is not listed in the table because the specific plastic(s) is (are) not identified by the manufacturers and the material seems unlikely to be of regulatory concern. One manufacturer lists “steel” (an alloy mostly of iron) as a component, but lists the CAS Number for iron. The information in the table above is based on the composition of the lithium-ion battery cells only, and does not reflect the constituents in other parts of a lithium-ion battery pack, such as the outer casing or printed circuit board.

Although the chemicals above are the only ones identified in the documents provided by the manufacturers, HP believes that other compounds containing lithium, metals, and/or carbon may be present, particularly in used batteries, due to chemical reactions that take place within the batteries, especially during use. For example, in a lithium ion battery containing a positive electrode made of lithium cobalt oxide, the primary overall reaction during use is $LiCoO_2 + C <=> Li_{1-x}CoO2 + CLi_x$.

FIRST AID MEASURES

Intact batteries do not represent a danger to health. If outer casing is damaged and exposure to internal materials results, the following first-aid actions are recommended:

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In response to inhalation: leave area immediately and seek medical attention.

In response to eye contact: rinse eyes with water for fifteen minutes and seek medical attention.

In response to skin contact, wash area thoroughly with soap and water and seek medical attention.

In response to ingestion, induce vomiting and seek medical attention.

FIRE FIGHTING MEASURES

Use suitable extinguishing media for the materials that are burning such as: chemical powder fire extinguishing medium, fire foam, carbon dioxide gas, nitrogen gas, dry sand, or water in large amounts. Water may react with available lithium or electrolyte in the batteries producing flammable hydrogen or hydrofluoric acid. When fighting fire, wear a self-contained breathing apparatus and protective suit. If possible, remove cells from firefighting area; if heated excessively, cells may rupture violently or vent irritating gas.

ACCIDENTAL RELEASE MEASURES

Personal precautions: use personal protective clothing; avoid contact with skin, eyes, and clothing; avoid breathing fumes.

Environmental precautions: do not discharge into the drains/surface waters/groundwater; place spilled materials into appropriate container and dispose of properly.

HANDLING AND STORAGE

Advice on safe handling
Avoid short-circuiting the cell. Do not open or disassemble. Keep away from open flames, hot surfaces, and sources of ignition.

Advice on storage
Store at room temperature at approximately 20%-60% of the normal battery capacity. Keep in appropriate packaging.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protective equipment is not required for handling intact cells. In response to ruptured cells, use the following equipment: respirator with air cylinder and dust mask; protective gloves; goggles or protective glasses designed to protect against liquid splashes; working clothes with long sleeves and long pants.

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

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Stability: stable under normal handling and use. If cell is ruptured, hazardous decomposition products may form.

Conditions to avoid: keep away from open flames, direct sunlight, and high humidity. Avoid contact of battery with water, strong oxidizers, and strong acids.

TOXICOLOGICAL INFORMATION

Routine handling and use of this product does not result in significant exposure to substances of toxicological concern.

ECOLOGICAL INFORMATION

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

DISPOSAL CONSIDERATIONS

Do not incinerate. Lithium-ion rechargeable 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 products. 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 lithium ion batteries.

TRANSPORTATION

Lithium-ion batteries are generally classified for purposes of transportation as UN 3480 when shipped individually or UN3481 when packed with or contained in equipment. However, the lithium-ion 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 have a Watt-hour rating of no more than 20 Wh per cell or no more than 100 Wh per battery pack and contain "equivalent lithium" in amounts no more than 1.5 g per cell or 8.0 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 (60th Edition, 2019) 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; 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 965, recalled or damaged lithium batteries are generally prohibited from air transportation.

INITIAL BATTERY CHARGE LEVEL

Lithium-ion batteries are shipped from the factory at a state of charge (SoC) below 30%. IATA requirements specify a SoC not to exceed 30% for air shipments of batteries without equipment.

ISSUE DATE

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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

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